



(51) International Patent Classification:

C07D 237/16 (2006.01) A01N 43/58 (2006.01)
C07D 405/04 (2006.01)

(21) International Application Number:

PCT/US2018/037330

(22) International Filing Date:

13 June 2018 (13.06.2018)

Published:

— with international search report (Art. 21(3))

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

62/527,523 30 June 2017 (30.06.2017) US

(71) Applicant: FMC CORPORATION [US/US]; 2929 Walnut Street, Philadelphia, PA 19104 (US).

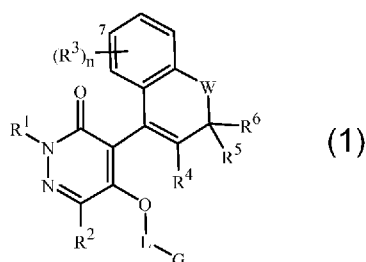
(72) Inventors: MARSHALL, Eric Allen; 96 Beaver Court, Rising Sun, MD 21911 (US). DEBERGH, John Robbins; 409 Spring Hollow Drive, Middletown, DE 19709 (US).

(74) Agent: COATS, Reed A.; FMC Corporation, 2929 Walnut Street, Philadelphia, PA 19104 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ,

(54) Title: 4-(3,4-DIHYDRONAPHTH-1-YL OR 2H-CHROMEN-4-YL)-5-HYDROXY-2H-PYRADIZIN-3-ONES AS HERBICIDES



(57) **Abstract:** Disclosed are compounds of Formula 1, including all stereoisomers, N-oxides, and salts thereof, Formula (1) wherein W, R¹, R², R³, n, R⁴, R⁵, R⁶, L and G are as defined in the disclosure. Also disclosed are compositions containing the compounds of Formula 1 and methods for controlling undesired vegetation comprising contacting the undesired vegetation or its environment with an effective amount of a compound or a composition of the invention.



TITLE

SATURATED BICYCLIC-SUBSTITUTED PYRADIZINONES AS HERBICIDES

FIELD OF THE INVENTION

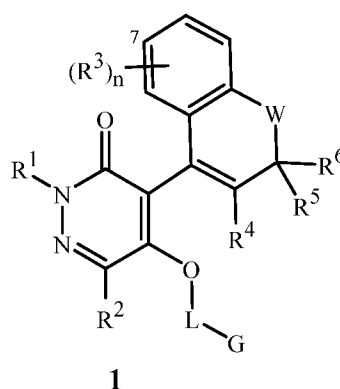
This invention relates to certain saturated bicyclic pyridazinones, their *N*-oxides, salts
 5 and compositions, and methods of their use for controlling undesirable vegetation.

BACKGROUND OF THE INVENTION

The control of undesired vegetation is extremely important in achieving high crop
 efficiency. Achievement of selective control of the growth of weeds especially in such
 useful crops as rice, soybean, sugar beet, maize, potato, wheat, barley, tomato and plantation
 10 crops, among others, is very desirable. Unchecked weed growth in such useful crops can
 cause significant reduction in productivity and thereby result in increased costs to the
 consumer. The control of undesired vegetation in noncrop areas is also important. Many
 products are commercially available for these purposes, but the need continues for new
 compounds that are more effective, less costly, less toxic, environmentally safer or have
 15 different sites of action. Patent application publications WO 2015/168010 and
 WO 2017/074992, and patent application PCT/US18/24742 disclose substituted
 pyridazinones. The saturated bicyclic pyridazinones of the present invention are not
 disclosed in these patent applications.

SUMMARY OF THE INVENTION

20 This invention is directed to compounds of Formula **1**, including all stereoisomers,
N-oxides of such compounds, and salts of such compounds, and agricultural compositions
 containing such compounds, and the use of such compounds as herbicides:



wherein

- 25 W is $-\text{C}(\text{R}^7)(\text{R}^8)-$ or $-\text{O}-$;
 R¹ is H, C₁–C₇ alkyl, C₃–C₈ alkylcarbonylalkyl, C₃–C₈ alkoxycarbonylalkyl, C₄–C₇
 alkylcycloalkyl, C₂–C₇ alkenyl, C₃–C₇ alkynyl, C₃–C₇ cycloalkyl, C₄–C₇
 cycloalkylalkyl, C₂–C₅ cyanoalkyl, C₁–C₄ nitroalkyl, C₂–C₇ haloalkoxyalkyl,

C₁–C₇ haloalkyl, C₂–C₇ haloalkenyl, C₂–C₇ alkoxyalkyl, C₃–C₇ alkylthioalkyl or C₁–C₇ alkoxy;

R² is H, halogen, cyano, -CHO, C₁–C₇ alkyl, C₃–C₈ alkylcarbonylalkyl, C₃–C₈ alkoxyalkyl, C₁–C₄ alkylcarbonyl, C₂–C₇ alkylcarbonyloxy, C₄–C₇ alkylcycloalkyl, C₂–C₇ alkenyl, C₃–C₇ alkynyl, C₁–C₄ alkylsulfinyl, C₁–C₄ alkylsulfonyl, C₁–C₄ alkylamino, C₂–C₈ dialkylamino, C₃–C₇ cycloalkyl, C₄–C₇ cycloalkylalkyl, C₂–C₅ cyanoalkyl, C₁–C₄ nitroalkyl, C₂–C₇ haloalkoxyalkyl, C₁–C₇ haloalkyl, C₂–C₇ haloalkenyl, C₂–C₇ alkoxyalkyl, C₁–C₇ alkoxy, C₁–C₅ alkylthio or C₂–C₃ alkoxyalkyl;

each R³ is independently H, halogen, nitro, cyano, C₁–C₅ alkyl, C₂–C₅ alkenyl, C₂–C₅ alkynyl, C₃–C₅ cycloalkyl, C₄–C₅ cycloalkylalkyl, C₁–C₅ haloalkyl, C₂–C₅ haloalkenyl, C₃–C₅ haloalkynyl, C₂–C₅ alkoxyalkyl, C₁–C₅ alkoxy, C₁–C₅ haloalkoxy, C₁–C₅ alkylthio, C₁–C₄ alkylsulfinyl, C₁–C₄ alkylsulfonyl, C₁–C₄ haloalkylthio or C₂–C₅ alkoxyalkyl;

n is 0 to 3;

each R⁴ is independently H, halogen, nitro, cyano, C₁–C₅ alkyl, C₂–C₅ alkenyl, C₂–C₅ alkynyl, C₃–C₅ cycloalkyl, C₄–C₅ cycloalkylalkyl, C₁–C₅ haloalkyl, C₂–C₅ haloalkenyl, C₃–C₅ haloalkynyl, C₂–C₅ alkoxyalkyl, C₁–C₅ alkoxy, C₁–C₅ haloalkoxy, C₁–C₅ alkylthio, C₁–C₄ alkylsulfinyl, C₁–C₄ alkylsulfonyl, C₁–C₄ haloalkylthio or C₂–C₅ alkoxyalkyl;

R⁵ is H or C₁–C₅ alkyl;

R⁶ is H or C₁–C₅ alkyl;

R⁷ is H or C₁–C₅ alkyl;

R⁸ is H or C₁–C₅ alkyl;

L is a direct bond, C₁–C₄ alkanediyl or C₂–C₄ alkenediyl;

G is H, C(=O)R⁹, C(=S)R⁹, CO₂R¹⁰, C(=O)SR¹⁰, S(O)₂R⁹, C(=O)N(R¹¹)(R¹²),

S(=O)₂N(R¹¹)(R¹²) or P(=O)(R¹³)(R¹⁴); or C₁–C₇ alkyl, C₂–C₅ alkenyl, C₂–C₅ alkynyl, C₁–C₇ haloalkyl, C₂–C₅ haloalkenyl, C₂–C₄ haloalkynyl, C₂–C₄ alkoxyalkyl, C₃–C₆ cycloalkyl or C₄–C₇ cycloalkylalkyl; or a 5- or 6-membered heterocyclic ring optionally substituted by halogen, C₁–C₄ alkyl or C₁–C₄ haloalkyl;

R⁹ and R¹¹ are independently H, C₁–C₇ alkyl, C₃–C₇ alkenyl, C₃–C₇ alkynyl, C₃–C₇ cycloalkyl, C₁–C₇ haloalkyl, C₃–C₇ haloalkenyl, C₂–C₇ alkoxyalkyl or C₄–C₇ cycloalkylalkyl; or phenyl, benzyl, or a 5- to 6-membered heterocyclic ring, each phenyl, benzyl or heterocyclic ring optionally substituted by halogen, C₁–C₄ alkyl or C₁–C₄ haloalkyl;

R¹⁰ is C₁–C₇ alkyl, C₃–C₇ alkenyl, C₃–C₇ alkynyl, C₃–C₇ cycloalkyl, C₂–C₇ haloalkyl, C₃–C₇ haloalkenyl, C₂–C₇ alkoxyalkyl or C₄–C₇ cycloalkylalkyl; or

phenyl, benzyl or a 5- to 6-membered heterocyclic ring, each phenyl, benzyl or heterocyclic ring optionally substituted by halogen, C₁–C₄ alkyl or C₁–C₄ haloalkyl;

- 5 R¹² is H, C₁–C₇ alkyl, C₂–C₇ alkenyl, C₂–C₇ alkynyl, C₃–C₇ cycloalkyl, C₄–C₇ cycloalkylalkyl, C₁–C₇ haloalkyl or C₂–C₇ alkoxyalkyl;
R¹³ is C₁–C₇ alkyl or C₁–C₇ alkoxy; and
R¹⁴ is C₁–C₇ alkyl or C₁–C₇ alkoxy.

10 More particularly, this invention pertains to a compound of Formula 1 (including all stereoisomers), an *N*-oxide or a salt thereof. This invention also relates to a herbicidal composition comprising a compound of the invention (i.e. in a herbicidally effective amount) and at least one component selected from the group consisting of surfactants, solid diluents and liquid diluents. This invention further relates to a method for controlling the growth of undesired vegetation comprising contacting the vegetation or its environment with a herbicidally effective amount of a compound of the invention (e.g., as a composition
15 described herein).

This invention also includes a herbicidal mixture comprising (a) a compound selected from Formula 1, *N*-oxides, and salts thereof, and (b) at least one additional active ingredient selected from (b1) through (b16); and salts of compounds of (b1) through (b16), as described below.

20 DETAILS OF THE INVENTION

As used herein, the terms “comprises,” “comprising,” “includes,” “including,” “has,” “having,” “contains,” “containing,” “characterized by” or any other variation thereof, are intended to cover a non-exclusive inclusion, subject to any limitation explicitly indicated. For example, a composition, mixture, process or method that comprises a list of elements is
25 not necessarily limited to only those elements but may include other elements not expressly listed or inherent to such composition, mixture, process or method.

The transitional phrase “consisting of” excludes any element, step, or ingredient not specified. If in the claim, such would close the claim to the inclusion of materials other than those recited except for impurities ordinarily associated therewith. When the phrase
30 “consisting of” appears in a clause of the body of a claim, rather than immediately following the preamble, it limits only the element set forth in that clause; other elements are not excluded from the claim as a whole.

The transitional phrase “consisting essentially of” is used to define a composition or method that includes materials, steps, features, components, or elements, in addition to those
35 literally disclosed, provided that these additional materials, steps, features, components, or elements do not materially affect the basic and novel characteristic(s) of the claimed

invention. The term “consisting essentially of” occupies a middle ground between “comprising” and “consisting of”.

Where applicants have defined an invention or a portion thereof with an open-ended term such as “comprising,” it should be readily understood that (unless otherwise stated) the description should be interpreted to also describe such an invention using the terms “consisting essentially of” or “consisting of.”

Further, unless expressly stated to the contrary, “or” refers to an inclusive or and not to an exclusive or. For example, a condition A or B is satisfied by any one of the following: A is true (or present) and B is false (or not present), A is false (or not present) and B is true (or present), and both A and B are true (or present).

Also, the indefinite articles “a” and “an” preceding an element or component of the invention are intended to be nonrestrictive regarding the number of instances (i.e. occurrences) of the element or component. Therefore “a” or “an” should be read to include one or at least one, and the singular word form of the element or component also includes the plural unless the number is obviously meant to be singular.

As referred to herein, the term “seedling”, used either alone or in a combination of words means a young plant developing from the embryo of a seed.

As referred to herein, the term “broadleaf” used either alone or in words such as “broadleaf weed” means dicot or dicotyledon, a term used to describe a group of angiosperms characterized by embryos having two cotyledons.

In the above recitations, the term “alkyl”, used either alone or in compound words such as “alkylthio” or “haloalkyl” includes straight-chain or branched alkyl, such as, methyl, ethyl, *n*-propyl, *i*-propyl, or the different butyl, pentyl or hexyl isomers. “Alkenyl” includes straight-chain or branched alkenes such as ethenyl, 1-propenyl, 2-propenyl, and the different butenyl, pentenyl and hexenyl isomers. “Alkenyl” also includes polyenes such as 1,2-propadienyl and 2,4-hexadienyl. “Alkynyl” includes straight-chain or branched alkynes such as ethynyl, 1-propynyl, 2-propynyl and the different butynyl, pentynyl and hexynyl isomers. “Alkynyl” can also include moieties comprised of multiple triple bonds such as 2,5-hexadiynyl.

“Alkoxy” includes, for example, methoxy, ethoxy, *n*-propyloxy, isopropyloxy and the different butoxy, pentoxy and hexyloxy isomers. “Alkoxyalkyl” denotes alkoxy substitution on alkyl. Examples of “alkoxyalkyl” include CH₃OCH₂, CH₃OCH₂CH₂, CH₃CH₂OCH₂, CH₃CH₂CH₂CH₂OCH₂ and CH₃CH₂OCH₂CH₂. “Alkoxyalkoxy” denotes alkoxy substitution on alkoxy. “Alkylthio” includes branched or straight-chain alkylthio moieties such as methylthio, ethylthio, and the different propylthio, butylthio, pentylthio and hexylthio isomers. “Alkylthioalkyl” denotes alkylthio substitution on alkyl. Examples of “alkylthioalkyl” include CH₃SCH₂, CH₃SCH₂CH₂, CH₃CH₂SCH₂, CH₃CH₂CH₂CH₂SCH₂ and CH₃CH₂SCH₂CH₂. “Cyanoalkyl” denotes an alkyl group substituted with one cyano

group. Examples of “cyanoalkyl” include NCCH_2 and NCCH_2CH_2 (alternatively identified as $\text{CH}_2\text{CH}_2\text{CN}$). The term “nitroalkyl” represents a nitro group bonded through an alkyl moiety. Examples of “nitroalkyl” include O_2NCH_2 and $\text{O}_2\text{NCH}_2\text{CH}_2$ (alternatively identified as $\text{CH}_2\text{CH}_2\text{NO}_2$). The terms “alkylamino” and “dialkylamino” refer to mono- and di-alkyl substitution on an amine moiety, respectively. Examples of “alkylamino” include $\text{CH}_3\text{NH-}$, $(\text{CH}_3)_2\text{CHNH-}$ and $\text{CH}_3\text{CH}_2\text{CH}_2\text{NH-}$. Examples of “dialkylamino” include $(\text{CH}_3)_2\text{N-}$, $(\text{CH}_3)_2\text{N-}$ and $(\text{CH}_3)_2\text{CH}_2\text{CH}_2\text{N-}$. “Alkylthio” includes branched or straight-chain alkylthio moieties such as methylthio, ethylthio, and the different propylthio, butylthio, pentylthio and hexylthio isomers. “Alkylsulfinyl” includes both enantiomers of an alkylsulfinyl group. Examples of “alkylsulfinyl” include $\text{CH}_3\text{S(O)-}$, $\text{CH}_3\text{CH}_2\text{S(O)-}$, $\text{CH}_3\text{CH}_2\text{CH}_2\text{S(O)-}$, $(\text{CH}_3)_2\text{CHS(O)-}$ and the different butylsulfinyl, pentylsulfinyl and hexylsulfinyl isomers. “Alkylsulfonyl” indicates a sulfonyl moiety substituted with a straight-chain or branched alkyl group. Examples of “alkylsulfonyl” include $\text{CH}_3\text{S(O)}_2\text{-}$, $\text{CH}_3\text{CH}_2\text{S(O)}_2\text{-}$, $\text{CH}_3\text{CH}_2\text{CH}_2\text{S(O)}_2\text{-}$, $(\text{CH}_3)_2\text{CHS(O)}_2\text{-}$, and the different butylsulfonyl, pentylsulfonyl and hexylsulfonyl isomers. “Alkylthioalkyl” denotes alkylthio substitution on alkyl. Examples of “alkylthioalkyl” include $\text{CH}_3\text{SCH}_2\text{-}$, $\text{CH}_3\text{SCH}_2\text{CH}_2\text{-}$, $\text{CH}_3\text{CH}_2\text{SCH}_2\text{-}$, $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{SCH}_2\text{-}$ and $\text{CH}_3\text{CH}_2\text{SCH}_2\text{CH}_2\text{-}$.

“Cycloalkyl” includes, for example, cyclopropyl, cyclobutyl, cyclopentyl and cyclohexyl. The term “cycloalkylalkyl” denotes cycloalkyl substitution on an alkyl moiety. Examples of “cycloalkylalkyl” include cyclopropylmethyl, cyclopentylethyl, and other cycloalkyl moieties bonded to straight-chain or branched alkyl groups. The term “alkylcycloalkyl” denotes alkyl substitution on a cycloalkyl moiety and includes, for example, ethylcyclopropyl, *i*-propylcyclobutyl, 3-methylcyclopentyl and 4-methylcyclohexyl.

The term “halogen”, either alone or in compound words such as “haloalkyl”, or when used in descriptions such as “alkyl substituted with halogen” includes fluorine, chlorine, bromine or iodine. Further, when used in compound words such as “haloalkyl”, or when used in descriptions such as “alkyl substituted with halogen” said alkyl may be partially or fully substituted with halogen atoms which may be the same or different. Examples of “haloalkyl” or “alkyl substituted with halogen” include F_3C , ClCH_2 , CF_3CH_2 and CF_3CCl_2 . The terms “haloalkoxy”, “haloalkylthio”, “haloalkenyl”, “haloalkynyl”, “haloalkoxyalkyl”, and the like, are defined analogously to the term “haloalkyl”. Examples of “haloalkoxy” include $\text{CF}_3\text{O-}$, $\text{CCl}_3\text{CH}_2\text{O-}$, $\text{HCF}_2\text{CH}_2\text{CH}_2\text{O-}$ and $\text{CF}_3\text{CH}_2\text{O-}$. Examples of “haloalkylthio” include $\text{CCl}_3\text{S-}$, $\text{CF}_3\text{S-}$, $\text{CCl}_3\text{CH}_2\text{S-}$ and $\text{ClCH}_2\text{CH}_2\text{CH}_2\text{S-}$. Examples of “haloalkenyl” include $(\text{Cl})_2\text{C=CHCH}_2\text{-}$ and $\text{CF}_3\text{CH}_2\text{CH=CHCH}_2\text{-}$. Examples of “haloalkynyl” include $\text{HC}\equiv\text{CCHCl-}$, $\text{CF}_3\text{C}\equiv\text{C-}$, $\text{CCl}_3\text{C}\equiv\text{C-}$ and $\text{FCH}_2\text{C}\equiv\text{CCH}_2\text{-}$. Examples of “haloalkoxyalkyl” include $\text{CF}_3\text{OCH}_2\text{CH}_2\text{-}$, $\text{CCl}_3\text{CH}_2\text{OCH}_2\text{-}$, $\text{HCF}_2\text{CH}_2\text{CH}_2\text{OCH}_2\text{-}$ and $\text{CF}_3\text{CH}_2\text{OCH}_2\text{-}$.

“Alkylcarbonyl” denotes a straight-chain or branched alkyl moiety bonded to a C(=O) moiety. Examples of “alkylcarbonyl” include $\text{CH}_3\text{C}(=\text{O})-$, $\text{CH}_3\text{CH}_2\text{CH}_2\text{C}(=\text{O})-$ and $(\text{CH}_3)_2\text{CHC}(=\text{O})-$. “Alkoxy carbonyl” denotes a straight-chain or branched alkoxy moieties bonded to a C(=O) moiety. Examples of “alkoxy carbonyl” include $\text{CH}_3\text{OC}(=\text{O})-$, $\text{CH}_3\text{CH}_2\text{OC}(=\text{O})-$, $\text{CH}_3\text{CH}_2\text{CH}_2\text{OC}(=\text{O})-$, $(\text{CH}_3)_2\text{CHOC}(=\text{O})-$ and the different butoxy- or pentoxycarbonyl isomers. “Alkylcarbonylalkyl” denotes a straight-chain or branched chain alkyl group bonded to the carbon atom of to a carbonylalkyl moiety. “Alkoxy carbonylalkyl” denotes a straight-chain or branched alkoxy carbonyl moieties bonded to linear or branched a alkylene moiety. Examples of “alkoxy carbonylalkyl” include $\text{CH}_3\text{OC}(=\text{O})\text{CH}_2\text{CH}_2-$, $\text{CH}_3\text{CH}_2\text{OC}(=\text{O})\text{CH}_2-$, $\text{CH}_3\text{CH}_2\text{CH}_2\text{OC}(=\text{O})\text{CH}_2\text{CH}(\text{CH}_3)-$, $(\text{CH}_3)_2\text{CHOC}(=\text{O})\text{CH}_2-$ and the different butoxy- or pentoxycarbonylalkyl isomers. “Alkylcarbonyloxy” denotes a straight-chain or branched-chain alkyl group bonded to the carbon atom of to a carbonyloxy moiety. Examples of “alkylcarbonyloxy” include $(\text{CH}_3)\text{C}(=\text{O})\text{O}-$ and $(\text{CH}_3\text{CH}_2)\text{C}(=\text{O})\text{O}-$. The term alkanediyl or alkenediyl refers to a linear or branched alkane or alkene linking chain respectively. Examples of alkanediyl include $-\text{CH}_2-$, $-\text{CH}_2\text{CH}(\text{CH}_3)-$ or $-\text{CH}_2\text{CH}_2\text{CH}_2-$. Examples of alkenediyl include $-\text{CH}=\text{CH}-$, $-\text{CH}_2\text{C}=\text{CH}-$ or $-\text{CH}=\text{C}(\text{CH}_3)-$. The term “adjacent” in the context of locating a substituent means “next to” or “immediately next to”.

The total number of carbon atoms in a substituent group is indicated by the “ C_i-C_j ” prefix where i and j are numbers from 1 to 7. For example, C_1-C_4 alkylsulfonyl designates methylsulfonyl through butylsulfonyl; C_2 alkoxyalkyl designates CH_3OCH_2- ; C_3 alkoxyalkyl designates, for example, $\text{CH}_3\text{CH}(\text{OCH}_3)-$, $\text{CH}_3\text{OCH}_2\text{CH}_2-$ or $\text{CH}_3\text{CH}_2\text{OCH}_2-$; and C_4 alkoxyalkyl designates the various isomers of an alkyl group substituted with an alkoxy group containing a total of four carbon atoms, examples including $\text{CH}_3\text{CH}_2\text{CH}_2\text{OCH}_2-$ and $\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_2-$.

When a compound is substituted with a substituent bearing a subscript that indicates the number of said substituents can exceed 1, said substituents (when they exceed 1) are independently selected from the group of defined substituents, (e.g., $(\text{R}^3)_n$, n is 0, 1, 2 or 3). When a group contains a substituent which can be hydrogen, for example R^3 or R^4 , then when this substituent is taken as hydrogen, it is recognized that this is equivalent to said group being unsubstituted. When a variable group is shown to be optionally attached to a position, for example $(\text{R}^3)_n$ wherein n may be 0, then hydrogen may be at the position even if not recited in the variable group definition. When one or more positions on a group are said to be “not substituted” or “unsubstituted”, then hydrogen atoms are attached to take up any free valency.

Unless otherwise indicated, a “ring” as a component of Formula 1 (e.g., substituent [J]) is carbocyclic or heterocyclic. The term “ring member” refers to an atom or other moiety (e.g., C(=O), C(=S), S(O) or S(O)₂) forming the backbone of a ring. The terms “carbocyclic

ring", "carbocycle" or "carbocyclic ring system" denote a ring wherein the atoms forming the ring backbone are selected only from carbon. Unless otherwise indicated, a carbocyclic ring can be a saturated, partially unsaturated, or fully unsaturated ring. When a fully unsaturated carbocyclic ring satisfies Hückel's rule, then said ring is also called an "aromatic ring". "Saturated carbocyclic" refers to a ring having a backbone consisting of carbon atoms linked to one another by single bonds; unless otherwise specified, the remaining carbon valences are occupied by hydrogen atoms.

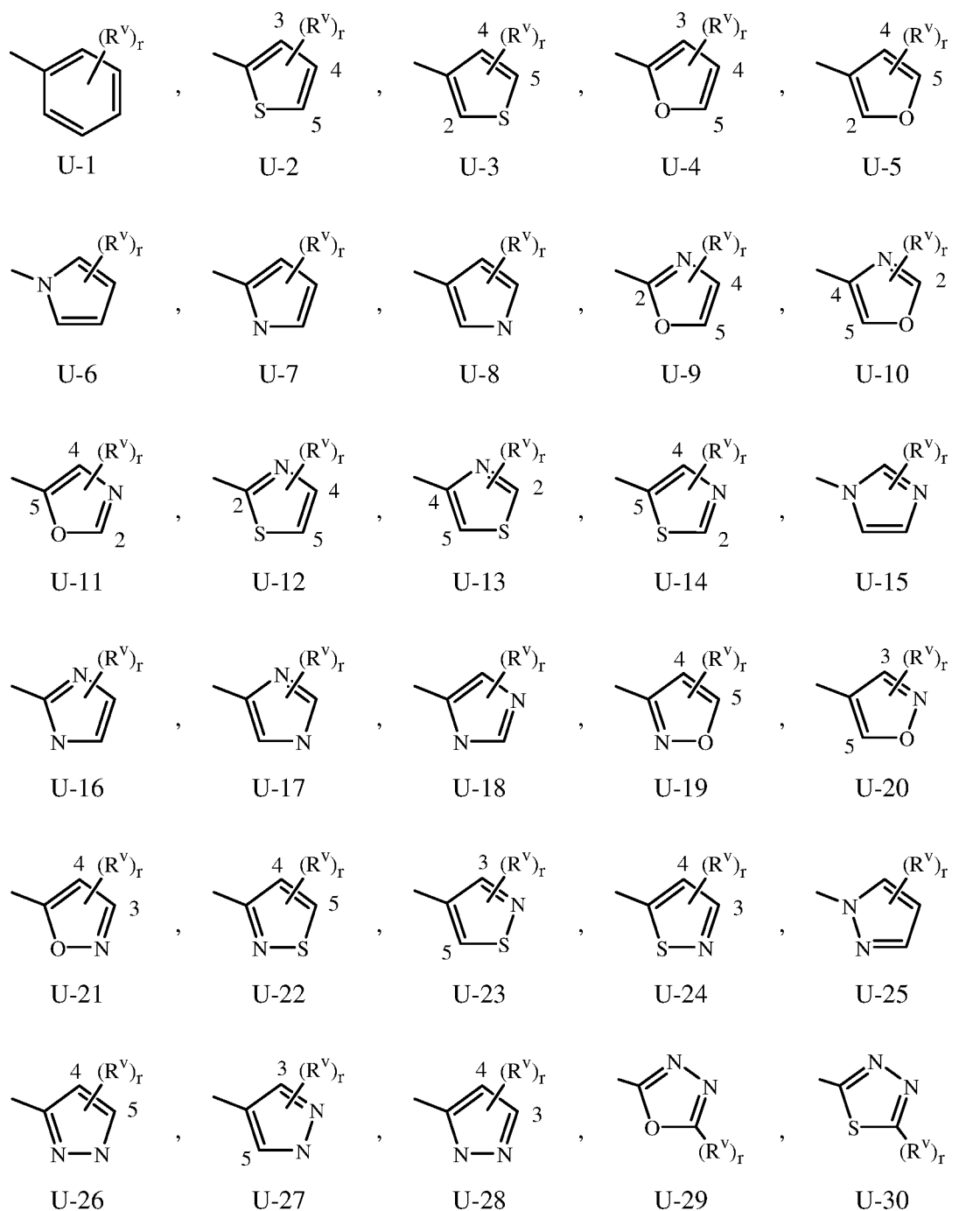
The terms "heterocyclic ring" or "heterocycle" denote a ring or ring system in which at least one atom forming the ring backbone is not carbon, e.g., nitrogen, oxygen or sulfur. Typically a heterocyclic ring contains no more than 4 nitrogens, no more than 2 oxygens and no more than 2 sulfurs. Unless otherwise indicated, a heterocyclic ring can be a saturated, partially unsaturated, or fully unsaturated ring. When a fully unsaturated heterocyclic ring satisfies Hückel's rule, then said ring is also called a "heteroaromatic ring" or "aromatic heterocyclic ring". Unless otherwise indicated, heterocyclic rings and ring systems can be attached through any available carbon or nitrogen by replacement of a hydrogen on said carbon or nitrogen. "Aromatic" indicates that each of the ring atoms is essentially in the same plane and has a *p*-orbital perpendicular to the ring plane, and that $(4n + 2) \pi$ electrons, where *n* is a positive integer, are associated with the ring to comply with Hückel's rule.

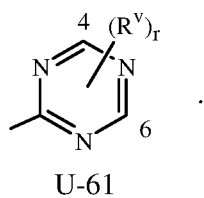
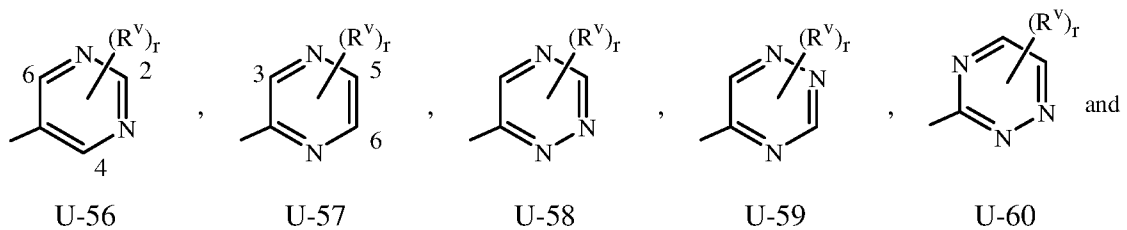
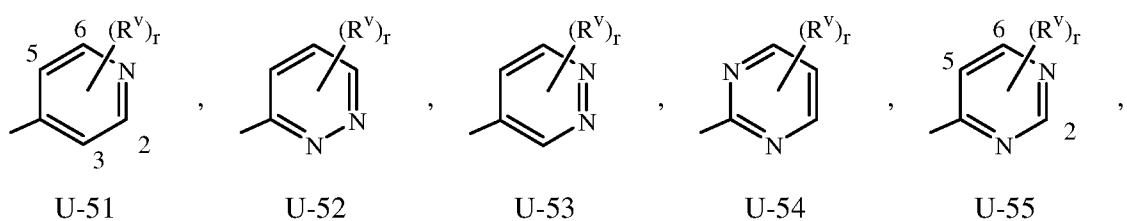
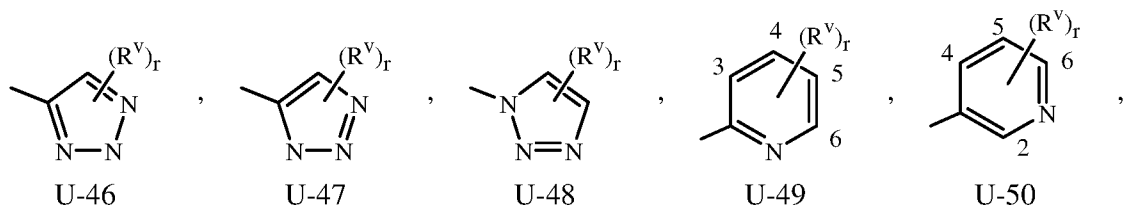
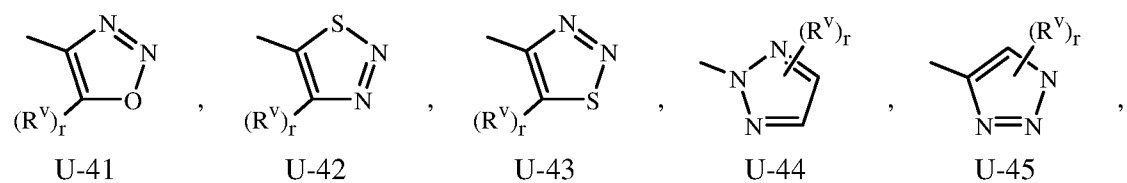
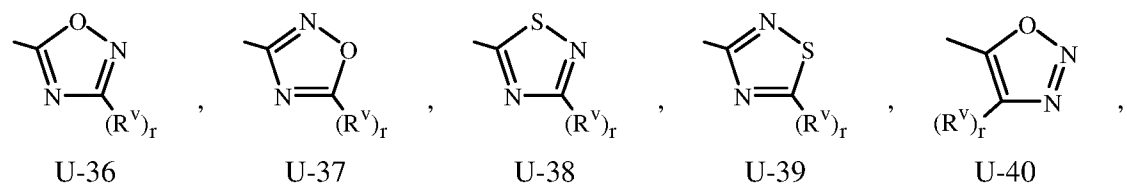
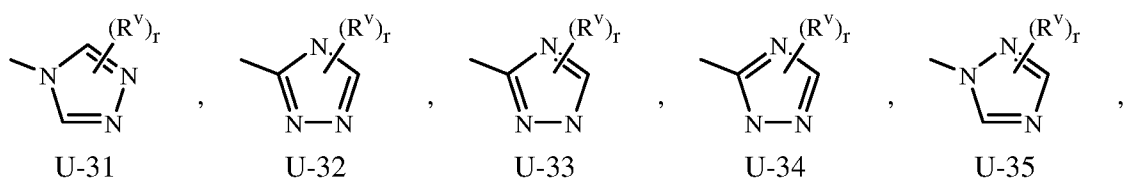
The term "optionally substituted" in connection with the heterocyclic rings refers to groups which are unsubstituted or have at least one non-hydrogen substituent that does not extinguish the biological activity possessed by the unsubstituted analog. As used herein, the following definitions shall apply unless otherwise indicated. The term "optionally substituted" is used interchangeably with the phrase "substituted or unsubstituted" or with the term "(un)substituted." Unless otherwise indicated, an optionally substituted group may have a substituent at each substitutable position of the group, and each substitution is independent of the other.

As noted above, G, R¹⁰ or R¹¹ can be (among others) phenyl optionally substituted with one or more substituents selected from a group of substituents as defined in the Summary of the Invention. An example of phenyl optionally substituted with one to five substituents is the ring illustrated as U-1 in Exhibit 1, wherein R^v is as defined in the Summary of the Invention for G and *r* is an integer from 0 to 5. As noted above, G, R¹⁰ or R¹¹ can be (among others) 5- or 6-membered heterocyclic ring, which may be saturated or unsaturated, optionally substituted with one or more substituents selected from a group of substituents as defined in the Summary of the Invention. Examples of a 5- or 6-membered unsaturated aromatic heterocyclic ring optionally substituted with from one or more substituents include the rings U-2 through U-61 illustrated in Exhibit 1 wherein R^v is any substituent as defined in the Summary of the Invention for G, R¹⁰ or R¹¹ and *r* is an integer from 0 to 4, limited by the number of available positions on each U group. As U-29, U-30,

U-36, U-37, U-38, U-39, U-40, U-41, U-42 and U-43 have only one available position, for these U groups r is limited to the integers 0 or 1, and r being 0 means that the U group is unsubstituted and a hydrogen is present at the position indicated by $(R^V)_r$.

Exhibit 1



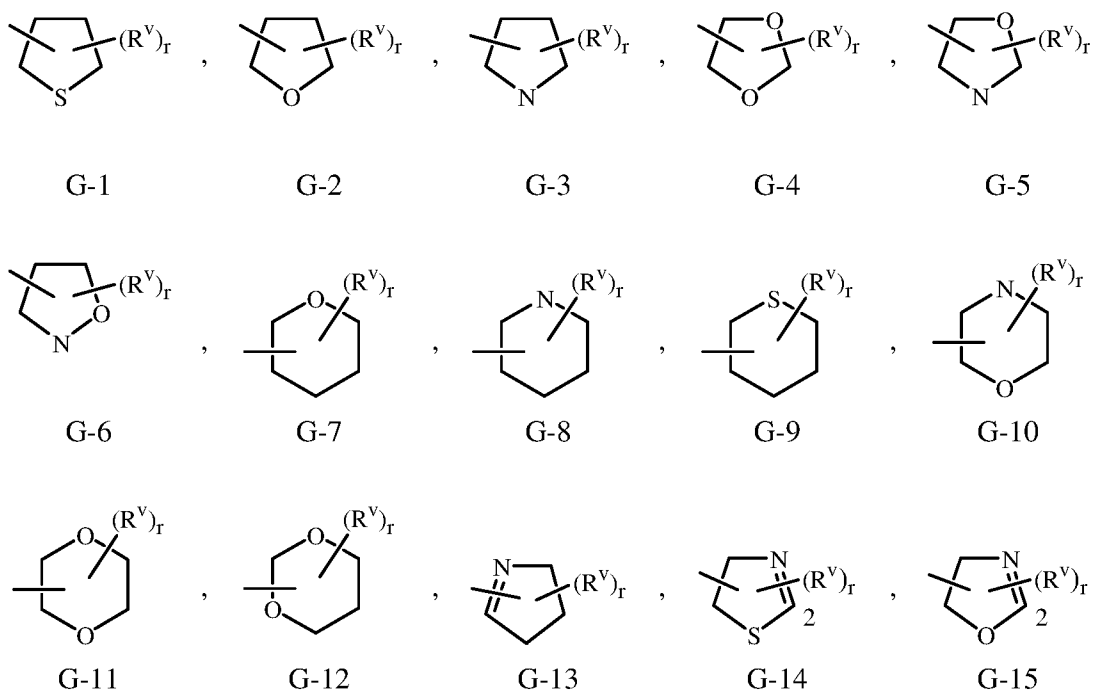


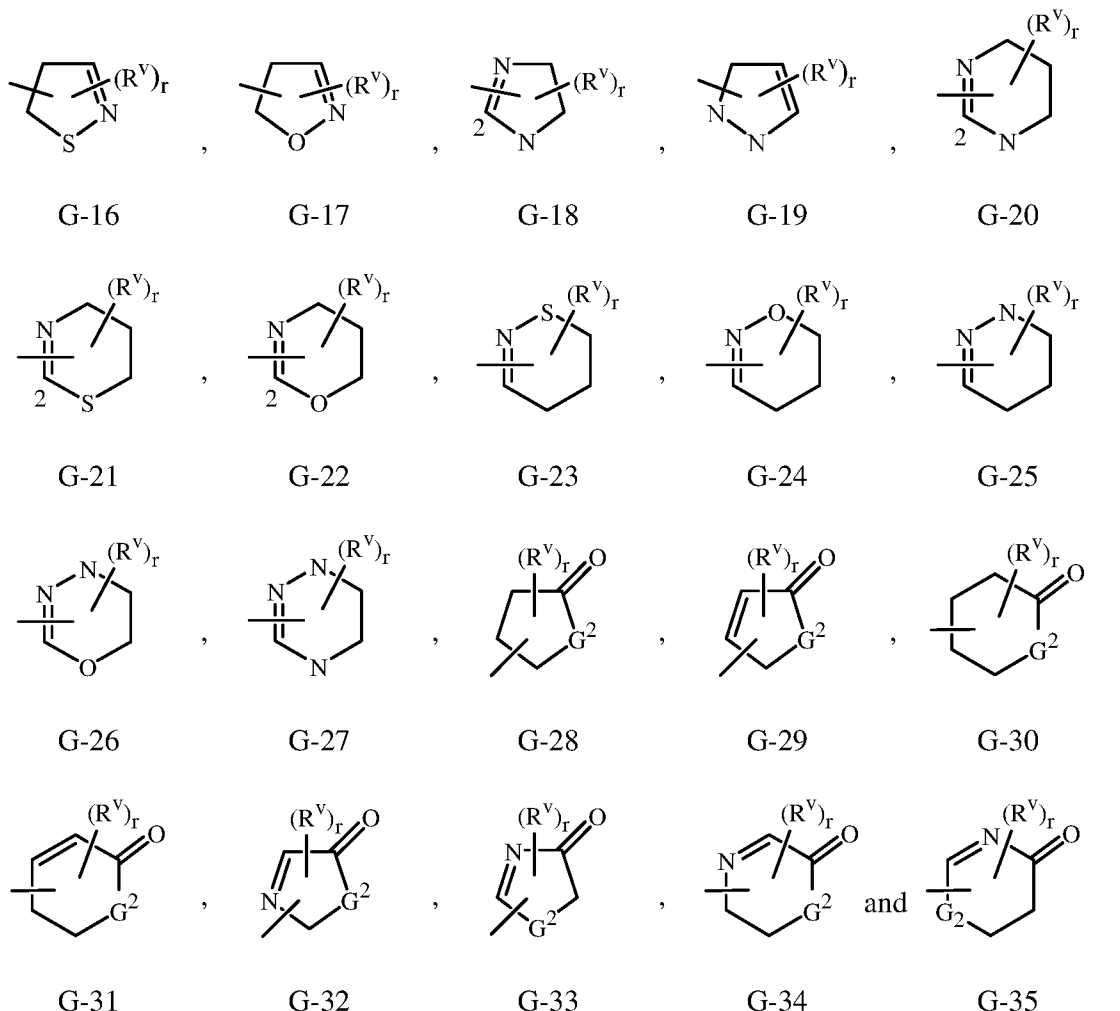
Note that when G, R¹⁰ or R¹¹ is a 5- or 6-membered saturated or unsaturated non-aromatic heterocyclic ring optionally substituted with one or more substituents selected from the group of substituents as defined in the Summary of the Invention for G, R¹⁰ or R¹¹, one or two carbon ring members of the heterocycle can optionally be in the oxidized form of a carbonyl moiety.

Examples of a 5- or 6-membered saturated or non-aromatic unsaturated heterocyclic ring containing ring members selected from up to two O atoms and up to two S atoms, and optionally substituted on carbon atom ring members with up to five halogen atoms includes the rings G-1 through G-35 as illustrated in Exhibit 2. Note that when the attachment point on the G group is illustrated as floating, the G group can be attached to the remainder of Formula 1 through any available carbon or nitrogen of the G group by replacement of a hydrogen atom. The optional substituents corresponding to R^v can be attached to any available carbon or nitrogen by replacing a hydrogen atom. For these G rings, r is typically an integer from 0 to 4, limited by the number of available positions on each G group.

Note that when G, R¹⁰ or R¹¹ comprises a ring selected from G-28 through G-35, G² is selected from O, S or N. Note that when G² is N, the nitrogen atom can complete its valence by substitution with either H or the substituents corresponding to R^v as defined in the Summary of the Invention as halogen, C₁-C₄ alkyl or C₁-C₄ haloalkyl.

Exhibit 2





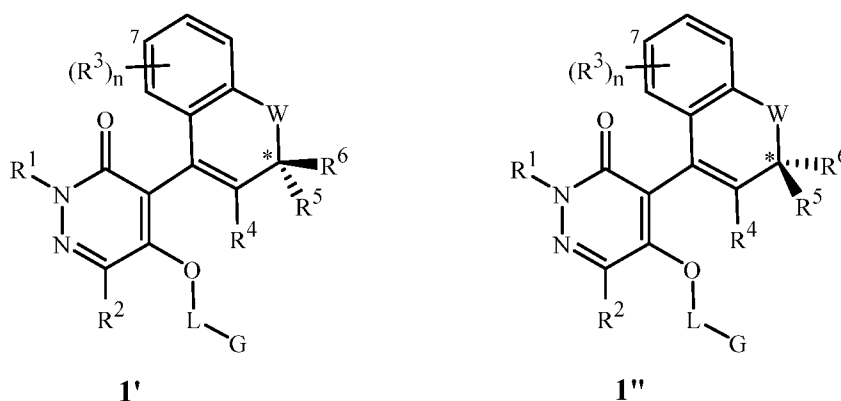
Although R^v groups are shown in the structures U-1 through U-61, it is noted that they do not need to be present since they are optional substituents. Note that when R^v is H when attached to an atom, this is the same as if said atom is unsubstituted. The nitrogen atoms that require substitution to fill their valence are substituted with H or R^v . Note that when the attachment point between $(R^v)_r$ and the U group is illustrated as floating, $(R^v)_r$ can be attached to any available carbon atom or nitrogen atom of the U group. Note that when the attachment point on the U group is illustrated as floating, the U group can be attached to the remainder of Formula 1 through any available carbon or nitrogen of the U group by replacement of a hydrogen atom. Note that some U groups can only be substituted with less than 4 R^v groups (e.g., U-2 through U-5, U-7 through U-48, and U-52 through U-61).

A wide variety of synthetic methods are known in the art to enable preparation of aromatic and nonaromatic heterocyclic rings and ring systems; for extensive reviews see the eight volume set of *Comprehensive Heterocyclic Chemistry*, A. R. Katritzky and C. W. Rees editors-in-chief, Pergamon Press, Oxford, 1984 and the twelve volume set of *Comprehensive*

Heterocyclic Chemistry II, A. R. Katritzky, C. W. Rees and E. F. V. Scriven editors-in-chief, Pergamon Press, Oxford, 1996.

Compounds of this invention can exist as one or more stereoisomers. The various stereoisomers include enantiomers, diastereomers, atropisomers and geometric isomers. Stereoisomers are isomers of identical constitution but differing in the arrangement of their atoms in space and include enantiomers, diastereomers, cis-trans isomers (also known as geometric isomers) and atropisomers. Atropisomers result from restricted rotation about single bonds where the rotational barrier is high enough to permit isolation of the isomeric species. One skilled in the art will appreciate that one stereoisomer may be more active and/or may exhibit beneficial effects when enriched relative to the other stereoisomer(s) or when separated from the other stereoisomer(s). Additionally, the skilled artisan knows how to separate, enrich, and/or to selectively prepare said stereoisomers. The compounds of the invention may be present as a mixture of stereoisomers, individual stereoisomers or as an optically active form.

For example, when R^5 or R^6 are dissimilar, then Formula **1** possesses a chiral center at the carbon atom to which R^1 is bonded. The two enantiomers are depicted as Formula **1'** and Formula **1''** with the chiral center identified with an asterisk (*). For a comprehensive discussion of all aspects of stereoisomerism, see Ernest L. Eliel and Samuel H. Wilen, *Stereochemistry of Organic Compounds*, John Wiley & Sons, 1994.



Note that when W is $-C(R^7)(R^8)-$ and R^7 and R^8 are different, then the carbon atom to which they are both bonded will also possess a chiral center. In combination with R^5 or R^6 being different these two chiral centers are referred to as “diastereomers”. Molecular depictions drawn herein follow standard conventions for depicting stereochemistry. To indicate stereoconfiguration, bonds rising from the plane of the drawing and towards the viewer are denoted by solid wedges wherein the broad end of the wedge is attached to the atom rising from the plane of the drawing towards the viewer. Bonds going below the plane of the drawing and away from the viewer are denoted by dashed wedges wherein the broad end of the wedge is attached to the atom further away from the viewer. Constant width lines

indicate bonds with a direction opposite or neutral relative to bonds shown with solid or dashed wedges; constant width lines also depict bonds in molecules or parts of molecules in which no particular stereoconfiguration is intended to be specified.

5 This invention comprises racemic mixtures, for example, equal amounts of the enantiomers of Formulae **1'** and **1''**, or when R⁷ and R⁸ are dissimilar. In addition, this invention includes compounds that are enriched compared to the racemic mixture in an enantiomer of Formula **1**. Also included are the essentially pure enantiomers of compounds of Formula **1**, for example, Formula **1'** and Formula **1''**.

10 When enantiomerically enriched, one enantiomer is present in greater amounts than the other, and the extent of enrichment can be defined by an expression of enantiomeric excess ("ee"), which is defined as $(2x-1) \cdot 100\%$, where x is the mole fraction of the dominant enantiomer in the mixture (e.g., an ee of 20% corresponds to a 60:40 ratio of enantiomers).

15 Preferably the compositions of this invention have at least a 50% enantiomeric excess; more preferably at least a 75% enantiomeric excess; still more preferably at least a 90% enantiomeric excess; and the most preferably at least a 94% enantiomeric excess of the more active isomer. Of particular note are enantiomerically pure embodiments of the more active isomer.

20 Compounds of Formula **1** can comprise additional chiral centers. For example, substituents and other molecular constituents such as R¹ and R² may themselves contain chiral centers. This invention comprises racemic mixtures as well as enriched and essentially pure stereoconfigurations at these additional chiral centers.

25 Compounds of Formula **1** typically exist in more than one form, and Formula **1** thus include all crystalline and non-crystalline forms of the compounds they represent. Non-crystalline forms include embodiments which are solids such as waxes and gums as well as embodiments which are liquids such as solutions and melts. Crystalline forms include
30 embodiments which represent essentially a single crystal type and embodiments which represent a mixture of polymorphs (i.e. different crystalline types). The term "polymorph" refers to a particular crystalline form of a chemical compound that can crystallize in different crystalline forms, these forms having different arrangements and/or conformations of the molecules in the crystal lattice. Although polymorphs can have the same chemical
35 composition, they can also differ in composition due the presence or absence of co-crystallized water or other molecules, which can be weakly or strongly bound in the lattice. Polymorphs can differ in such chemical, physical and biological properties as crystal shape, density, hardness, color, chemical stability, melting point, hygroscopicity, suspensibility, dissolution rate and biological availability. One skilled in the art will appreciate that a polymorph of a compound of Formula **1** can exhibit beneficial effects (e.g., suitability for preparation of useful formulations, improved biological performance) relative to another polymorph or a mixture of polymorphs of the same compound of Formula **1**. Preparation

and isolation of a particular polymorph of a compound of Formula **1** can be achieved by methods known to those skilled in the art including, for example, crystallization using selected solvents and temperatures. For a comprehensive discussion of polymorphism see R. Hilfiker, Ed., *Polymorphism in the Pharmaceutical Industry*, Wiley-VCH, Weinheim, 2006.

5 One skilled in the art will appreciate that not all nitrogen-containing heterocycles can form *N*-oxides since the nitrogen requires an available lone pair for oxidation to the oxide; one skilled in the art will recognize those nitrogen-containing heterocycles which can form *N*-oxides. One skilled in the art will also recognize that tertiary amines can form *N*-oxides. Synthetic methods for the preparation of *N*-oxides of heterocycles and tertiary amines are
10 very well known by one skilled in the art including the oxidation of heterocycles and tertiary amines with peroxy acids such as peracetic and *m*-chloroperbenzoic acid (MCPBA), hydrogen peroxide, alkyl hydroperoxides such as *t*-butyl hydroperoxide, sodium perborate, and dioxiranes such as dimethyldioxirane. These methods for the preparation of *N*-oxides have been extensively described and reviewed in the literature, see for example:
15 T. L. Gilchrist in *Comprehensive Organic Synthesis*, vol. 7, pp 748–750, S. V. Ley, Ed., Pergamon Press; M. Tisler and B. Stanovnik in *Comprehensive Heterocyclic Chemistry*, vol. 3, pp 18–20, A. J. Boulton and A. McKillop, Eds., Pergamon Press; M. R. Grimmett and B. R. T. Keene in *Advances in Heterocyclic Chemistry*, vol. 43, pp 149–161, A. R. Katritzky, Ed., Academic Press; M. Tisler and B. Stanovnik in *Advances in Heterocyclic Chemistry*,
20 vol. 9, pp 285–291, A. R. Katritzky and A. J. Boulton, Eds., Academic Press; and G. W. H. Cheeseman and E. S. G. Werstiuk in *Advances in Heterocyclic Chemistry*, vol. 22, pp 390–392, A. R. Katritzky and A. J. Boulton, Eds., Academic Press.

One skilled in the art recognizes that because in the environment and under physiological conditions salts of chemical compounds are in equilibrium with their
25 corresponding nonsalt forms, salts share the biological utility of the nonsalt forms. Thus a wide variety of salts of a compound of Formula **1** are useful for control of undesired vegetation (i.e. are agriculturally suitable). The salts of a compound of Formula **1** include acid-addition salts with inorganic or organic acids such as hydrobromic, hydrochloric, nitric, phosphoric, sulfuric, acetic, butyric, fumaric, lactic, maleic, malonic, oxalic, propionic,
30 salicylic, tartaric, 4-toluenesulfonic or valeric acids. When a compound of Formula **1** contains an acidic moiety such as a carboxylic acid or phenol, salts also include those formed with organic or inorganic bases such as pyridine, triethylamine or ammonia, or amides, hydrides, hydroxides or carbonates of sodium, potassium, lithium, calcium, magnesium or barium. Accordingly, the present invention comprises compounds selected from Formula **1**,
35 *N*-oxides and agriculturally suitable salts thereof.

Embodiments of the present invention as described in the Summary of the Invention include where Formula **1** including *N*-oxides, salts, compositions and use thereof are described as follows:

Embodiment 1. A compound of Formula 1, including all stereoisomers, *N*-oxides, and salts thereof, agricultural compositions containing them and their use as herbicides as described in the Summary of the Invention.

Embodiment 2. A compound of Embodiment 1 wherein W is $-C(R^7)(R^8)-$.

5 Embodiment 3. A compound of Embodiment 1 wherein W is $-O-$.

Embodiment 4. A compound of any one of Embodiments 1 through 3 wherein wherein R^1 is H, C_1-C_7 alkyl, C_3-C_8 alkylcarbonylalkyl, C_3-C_8 alkoxy carbonylalkyl, C_4-C_7 alkylcycloalkyl, C_3-C_7 cycloalkyl, C_4-C_7 cycloalkylalkyl, C_1-C_7 haloalkyl, C_2-C_7 haloalkenyl, C_2-C_7 alkoxyalkyl or C_1-C_7 alkoxy.

10 Embodiment 5. A compound of Embodiment 4 wherein R^1 is H, C_1-C_7 alkyl, C_3-C_8 alkylcarbonylalkyl, C_3-C_8 alkoxy carbonylalkyl, C_4-C_7 alkylcycloalkyl, C_3-C_7 cycloalkyl, C_4-C_7 cycloalkylalkyl, C_2-C_7 alkoxyalkyl or C_1-C_7 alkoxy.

Embodiment 6. A compound of Embodiment 5 wherein R^1 is H, C_1-C_7 alkyl, C_4-C_7 alkylcycloalkyl, C_3-C_7 cycloalkyl, C_4-C_7 cycloalkylalkyl or C_2-C_7 alkoxyalkyl.

15 Embodiment 7. A compound of Embodiment 6 wherein R^1 is H, C_1-C_7 alkyl, C_3-C_7 cycloalkyl, C_4-C_7 cycloalkylalkyl or C_2-C_7 alkoxyalkyl.

Embodiment 8. A compound of Embodiment 7 wherein R^1 is H, C_1-C_7 alkyl, C_3-C_7 cycloalkyl or C_2-C_7 alkoxyalkyl.

Embodiment 9. A compound of Embodiment 8 wherein R^1 is H or C_1-C_7 alkyl.

20 Embodiment 10. A compound of Embodiment 9 wherein R^1 is H.

Embodiment 11. A compound of Embodiment 9 wherein R^1 is C_1-C_4 alkyl.

Embodiment 12. A compound of Embodiment 11 wherein R^1 is C_2-C_4 alkyl.

Embodiment 13. A compound of Embodiment 11 wherein R^1 is methyl or ethyl.

Embodiment 14. A compound of Embodiment 13 wherein R^1 is methyl.

25 Embodiment 15. A compound of any one of Embodiments 1 through 9 wherein R^1 is other than methyl.

Embodiment 16. A compound of any one of Embodiments 1 through 10 wherein R^1 is other than H.

30 Embodiment 17. A compound of any one of Embodiments 1 through 16 wherein R^2 is H, halogen, cyano, $-CHO$, C_1-C_7 alkyl, C_3-C_8 alkylcarbonylalkyl, C_3-C_8 alkoxy carbonylalkyl, C_1-C_4 alkylcarbonyl, C_2-C_7 alkylcarbonyloxy, C_4-C_7 alkylcycloalkyl, C_3-C_7 cycloalkyl, C_4-C_7 cycloalkylalkyl, C_2-C_7 haloalkoxyalkyl, C_1-C_7 haloalkyl, C_2-C_7 alkoxyalkyl, C_1-C_7 alkoxy, C_1-C_5 alkylthio or C_2-C_3 alkoxy carbonyl.

35 Embodiment 18. A compound of Embodiment 17 wherein R^2 is H, halogen, cyano, $-CHO$, C_1-C_7 alkyl, C_4-C_7 alkylcycloalkyl, C_3-C_7 cycloalkyl, C_4-C_7 cycloalkylalkyl, C_2-C_7 haloalkoxyalkyl, C_1-C_7 haloalkyl, C_2-C_7 alkoxyalkyl, C_1-C_7 alkoxy or C_1-C_5 alkylthio.

- Embodiment 19. A compound of Embodiment 18 wherein R^2 is H, halogen, cyano, C_1-C_7 alkyl, C_2-C_7 haloalkoxyalkyl, C_1-C_7 haloalkyl, C_2-C_7 alkoxyalkyl, C_1-C_7 alkoxy or C_1-C_5 alkylthio.
- Embodiment 20. A compound of Embodiment 19 wherein R^2 is H, halogen, cyano, C_1-C_7 alkyl, C_1-C_7 haloalkyl or C_1-C_7 alkoxy.
- Embodiment 21. A compound of Embodiment 20 wherein R^2 is H, Cl, Br, I, cyano, methyl, CF_3 or methoxy.
- Embodiment 22. A compound of Embodiment 21 wherein R^2 is H, Cl, methyl or methoxy.
- Embodiment 23. A compound of Embodiment 22 wherein R^2 is Cl or methyl.
- Embodiment 24. A compound of Embodiment 22 wherein R^2 is Cl.
- Embodiment 25. A compound of Embodiment 22 wherein R^2 is methyl.
- Embodiment 26. A compound of Embodiment 22 wherein R^2 is methoxy.
- Embodiment 27. A compound of any one of Embodiments 1 through 22 wherein R^2 is other than H.
- Embodiment 28. A compound of any one of Embodiments 1 through 27 wherein each R^3 is independently H, halogen, C_1-C_5 alkyl, C_3-C_5 cycloalkyl, C_1-C_5 haloalkyl, C_1-C_5 alkoxy or C_1-C_5 haloalkoxy.
- Embodiment 29. A compound of Embodiment 28 wherein each R^3 is independently H, halogen, C_1-C_5 alkyl, C_1-C_5 haloalkyl, C_1-C_5 alkoxy or C_1-C_5 haloalkoxy.
- Embodiment 30. A compound of Embodiment 29 wherein each R^3 is independently H, halogen, methyl, ethyl, CF_3 or $-OCHF_2$.
- Embodiment 31. A compound of Embodiment 30 wherein each R^3 is independently H, F, Cl, Br or methyl.
- Embodiment 32. A compound of Embodiment 31 wherein each R^3 is H.
- Embodiment 33. A compound of Embodiment 31 wherein each R^3 is independently H, Cl, Br or methyl.
- Embodiment 34. A compound of Embodiment 33 wherein each R^3 is independently H or methyl.
- Embodiment 35. A compound of any one of Embodiments 1 through 34 wherein n is 0 to 2.
- Embodiment 36. A compound of Embodiment 35 wherein n is 0 or 1.
- Embodiment 37. A compound of Embodiment 36 wherein n is 1.
- Embodiment 38. A compound of any one of Embodiments 1 through 37 wherein R^3 is located at the 7-position.
- Embodiment 39. A compound of any one of Embodiments 1 through 38 wherein R^4 is H, halogen, C_1-C_3 alkyl, C_3-C_4 cycloalkyl, C_1-C_3 haloalkyl or C_1-C_3 alkoxy.

Embodiment 40. A compound of Embodiment 39 wherein R^4 is H, halogen, C_1-C_2 alkyl, cyclopropyl or C_1-C_2 haloalkyl.

Embodiment 41. A compound of Embodiment 40 wherein R^4 is H, halogen, methyl, ethyl or CF_3 .

5 Embodiment 42. A compound of Embodiment 41 wherein R^4 is H, F, Cl, Br or methyl.

Embodiment 43. A compound of Embodiment 42 wherein R^4 is methyl.

Embodiment 44. A compound of Embodiment 42 wherein R^4 is H.

Embodiment 45. A compound of any one of Embodiments 1 through 44 wherein R^5 is H or methyl.

10 Embodiment 46. A compound of Embodiment 45 wherein R^5 is H.

Embodiment 47. A compound of any one of Embodiments 1 through 46 wherein R^6 is H or methyl.

Embodiment 48. A compound of Embodiment 47 wherein R^6 is H.

Embodiment 49. A compound of any one of Embodiments 1 through 48 wherein R^7 is H or methyl.

15

Embodiment 50. A compound of Embodiment 49 wherein R^7 is H.

Embodiment 51. A compound of any one of Embodiments 1 through 50 wherein R^8 is H or methyl.

Embodiment 52. A compound of Embodiment 51 wherein R^8 is H.

20

Embodiment 53. A compound of any one of Embodiments 1 through 52 wherein L is a direct bond or C_1-C_2 alkanediyl.

Embodiment 54. A compound of Embodiment 53 wherein L is a direct bond.

Embodiment 55. A compound of any one of Embodiments 1 through 52 wherein L is C_1-C_2 alkanediyl or C_2-C_3 alkenediyl.

25

Embodiment 56. A compound of any one of Embodiments 1 through 53 or 55 wherein L is C_1-C_2 alkanediyl.

Embodiment 57. A compound of Embodiment 55 wherein L is $-CH_2-$ or $-CH=CH-$.

Embodiment 58. A compound of Embodiment 57 wherein L is $-CH_2-$.

Embodiment 59. A compound of any one of Embodiments 1 through 58 wherein G is H,

30

$C(=O)R^9$, $C(=S)R^9$, CO_2R^{10} , $C(=O)SR^{10}$, $C(=O)N(R^{11})(R^{12})$ or $P(=O)(R^{13})(R^{14})$; or C_1-C_4 alkyl, C_2-C_4 alkenyl, C_2-C_4 alkynyl, C_1-C_4 haloalkyl, C_2-C_4 haloalkenyl, C_2-C_4 haloalkynyl, C_2-C_4 alkoxyalkyl, C_3-C_6 cycloalkyl or C_4-C_7 cycloalkylalkyl.

Embodiment 60. A compound of Embodiment 59 wherein G is H, $C(=O)R^9$, CO_2R^{10} , $C(=O)N(R^{11})(R^{12})$ or $P(=O)(R^{13})(R^{14})$; or C_1-C_4 alkyl, C_2-C_4 alkenyl, C_1-C_4 haloalkyl, C_2-C_4 haloalkenyl, C_2-C_4 alkoxyalkyl, C_3-C_6 cycloalkyl or C_4-C_7 cycloalkylalkyl.

35

Embodiment 61. A compound of Embodiment 60 wherein G is H, C(=O)R⁹, CO₂R¹⁰ or P(=O)(R¹³)(R¹⁴); or C₁–C₄ alkyl, C₁–C₄ haloalkyl, C₂–C₄ alkoxyalkyl or C₃–C₆ cycloalkyl.

Embodiment 62. A compound of Embodiment 61 wherein G is H, C(=O)R⁹ or CO₂R¹⁰; or C₂–C₄ alkoxyalkyl or C₃–C₆ cycloalkyl.

Embodiment 63. A compound of Embodiment 62 wherein G is H.

Embodiment 64. A compound of Embodiment 62 wherein G is C(=O)R⁹.

Embodiment 65. A compound of Embodiment 62 wherein G is CO₂R¹⁰.

Embodiment 66. A compound of Embodiment 62 wherein G is C₂–C₄ alkoxyalkyl.

Embodiment 67. A compound of Embodiment 62 wherein G is C₃–C₆ cycloalkyl.

Embodiment 68. A compound of any one of Embodiments 1 through 62 or 64 wherein R⁹ and R¹¹ are independently H, C₁–C₇ alkyl, C₃–C₇ alkenyl, C₃–C₇ alkynyl, C₃–C₇ cycloalkyl or C₁–C₇ haloalkyl; or phenyl, benzyl, or a 6-membered heterocyclic ring, each phenyl, benzyl or heterocyclic ring optionally substituted by halogen, C₁–C₄ alkyl or C₁–C₄ haloalkyl.

Embodiment 69. A compound of Embodiment 68 wherein R⁹ and R¹¹ are independently H, C₁–C₇ alkyl or C₃–C₇ alkenyl; or phenyl, benzyl, each phenyl or benzyl optionally substituted by halogen, C₁–C₄ alkyl or C₁–C₄ haloalkyl.

Embodiment 70. A compound of Embodiment 69 wherein R⁹ is H or C₁–C₇ alkyl; or benzyl optionally substituted by halogen, C₁–C₄ alkyl or C₁–C₄ haloalkyl.

Embodiment 71. A compound of Embodiment 70 wherein R⁹ is C₁–C₇ alkyl; or benzyl optionally substituted by halogen, C₁–C₄ alkyl or C₁–C₄ haloalkyl.

Embodiment 72. A compound of any one of Embodiments 1 through 62 or 65 wherein R¹⁰ is C₁–C₇ alkyl, C₃–C₇ alkenyl, C₃–C₇ cycloalkyl, C₂–C₇ haloalkyl or C₃–C₇ haloalkenyl; or phenyl, benzyl or a 6-membered heterocyclic ring, each phenyl, benzyl or heterocyclic ring optionally substituted by halogen, C₁–C₄ alkyl or C₁–C₄ haloalkyl.

Embodiment 73. A compound of Embodiment 72 wherein R¹⁰ is C₁–C₇ alkyl or C₃–C₇ cycloalkyl; or phenyl or benzyl, each phenyl or benzyl optionally substituted by halogen, C₁–C₄ alkyl or C₁–C₄ haloalkyl.

Embodiment 74. A compound of Embodiment 73 wherein R¹⁰ is C₁–C₇ alkyl; or phenyl optionally substituted by halogen, C₁–C₄ alkyl or C₁–C₄ haloalkyl.

Embodiment 75. A compound of Embodiment 74 wherein R¹⁰ is CH₃, CH₂CH₃, CH₂CH₂CH₃, Ph, Ph(4-Cl), Ph(3-CF₃) or Ph(4-CF₃).

Embodiment 76. A compound of any one of Embodiments 1 through 75 wherein R¹² is H, C₁–C₇ alkyl, C₂–C₇ alkenyl, C₂–C₇ alkynyl or C₃–C₇ cycloalkyl.

Embodiment 77. A compound of Embodiment 76 wherein R¹² is H, C₁–C₇ alkyl or C₃–C₇ cycloalkyl.

Embodiment 78. A compound of any one of Embodiments 1 through 77 wherein R¹³ is C₁–C₄ alkyl or C₁–C₄ alkoxy.

Embodiment 79. A compound of Embodiment 78 wherein R¹³ is C₁–C₂ alkyl or C₁–C₂ alkoxy.

5 Embodiment 80. A compound of any one of Embodiments 1 through 79 wherein R¹⁴ is C₁–C₄ alkyl or C₁–C₄ alkoxy.

Embodiment 81. A compound of Embodiment 80 wherein R¹⁴ is C₁–C₂ alkyl or C₁–C₂ alkoxy.

10 Embodiments of this invention, including Embodiments 1–81 above as well as any other embodiments described herein, can be combined in any manner, and the descriptions of variables in the embodiments pertain not only to the compounds of Formula **1** but also to the starting compounds and intermediate compounds useful for preparing the compounds of Formula **1**. In addition, embodiments of this invention, including Embodiments 1–81 above as well as any other embodiments described herein, and any combination thereof, pertain to
15 the compositions and methods of the present invention.

Embodiment A. A compound of Formula **1** wherein

R¹ is H, C₁–C₇ alkyl, C₃–C₈ alkylcarbonylalkyl, C₃–C₈ alkoxy carbonylalkyl, C₄–C₇ alkylcycloalkyl, C₃–C₇ cycloalkyl, C₄–C₇ cycloalkylalkyl, C₁–C₇ haloalkyl, C₂–C₇ haloalkenyl, C₂–C₇ alkoxyalkyl or C₁–C₇ alkoxy;

20 R² is H, halogen, cyano, -CHO, C₁–C₇ alkyl, C₃–C₈ alkylcarbonylalkyl, C₃–C₈ alkoxy carbonylalkyl, C₁–C₄ alkylcarbonyl, C₂–C₇ alkylcarbonyloxy, C₄–C₇ alkylcycloalkyl, C₃–C₇ cycloalkyl, C₄–C₇ cycloalkylalkyl, C₂–C₇ haloalkoxyalkyl, C₁–C₇ haloalkyl, C₂–C₇ alkoxyalkyl, C₁–C₇ alkoxy, C₁–C₅ alkylthio or C₂–C₃ alkoxy carbonyl;

25 each R³ is independently H, halogen, C₁–C₅ alkyl, C₃–C₅ cycloalkyl, C₁–C₅ haloalkyl, C₁–C₅ alkoxy or C₁–C₅ haloalkoxy;

n is 0 to 2;

R⁴ is H, halogen, C₁–C₃ alkyl, C₃–C₄ cycloalkyl, C₁–C₃ haloalkyl or C₁–C₃ alkoxy;

L is a direct bond or C₁–C₂ alkanediyl;

30 G is H, C(=O)R⁹, C(=S)R⁹, CO₂R¹⁰, C(=O)SR¹⁰, CON(R¹¹)(R¹²) or P(=O)(R¹³)(R¹⁴); or C₁–C₄ alkyl, C₂–C₄ alkenyl, C₂–C₄ alkynyl, C₁–C₄ haloalkyl, C₂–C₄ haloalkenyl, C₂–C₄ haloalkynyl, C₂–C₄ alkoxyalkyl, C₃–C₆ cycloalkyl or C₄–C₇ cycloalkylalkyl;

35 R⁹ and R¹¹ are independently H, C₁–C₇ alkyl, C₃–C₇ alkenyl, C₃–C₇ alkynyl, C₃–C₇ cycloalkyl or C₁–C₇ haloalkyl; or phenyl, benzyl, or a 6-membered heterocyclic ring, each phenyl, benzyl or heterocyclic ring optionally substituted by halogen, C₁–C₄ alkyl or C₁–C₄ haloalkyl;

R¹⁰ is C₁–C₇ alkyl, C₃–C₇ alkenyl, C₃–C₇ cycloalkyl, C₂–C₇ haloalkyl or C₃–C₇ haloalkenyl; or phenyl, benzyl or a 6-membered heterocyclic ring, each phenyl, benzyl or heterocyclic ring optionally substituted by halogen, C₁–C₄ alkyl or C₁–C₄ haloalkyl;

5 R¹² is H, C₁–C₇ alkyl, C₂–C₇ alkenyl, C₂–C₇ alkynyl or C₃–C₇ cycloalkyl;

R¹³ is C₁–C₄ alkyl or C₁–C₄ alkoxy; and

R¹⁴ is C₁–C₄ alkyl or C₁–C₄ alkoxy.

Embodiment B. A compound of Embodiment A wherein

10 R¹ is H, C₁–C₇ alkyl, C₃–C₈ alkylcarbonylalkyl, C₃–C₈ alkoxy carbonylalkyl, C₄–C₇ alkylcycloalkyl, C₃–C₇ cycloalkyl, C₄–C₇ cycloalkylalkyl, C₂–C₇ alkoxyalkyl or C₁–C₇ alkoxy;

R² is H, halogen, cyano, -CHO, C₁–C₇ alkyl, C₄–C₇ alkylcycloalkyl, C₃–C₇ cycloalkyl, C₄–C₇ cycloalkylalkyl, C₂–C₇ haloalkoxyalkyl, C₁–C₇ haloalkyl, C₂–C₇ alkoxyalkyl, C₁–C₇ alkoxy or C₁–C₅ alkylthio;

15 each R³ is independently H, halogen, C₁–C₅ alkyl, C₁–C₅ haloalkyl, C₁–C₅ alkoxy or C₁–C₅ haloalkoxy;

n is 0 or 1;

R⁴ is H, halogen, C₁–C₂ alkyl, cyclopropyl or C₁–C₂ haloalkyl;

L is a direct bond;

20 G is H, C(=O)R⁹, CO₂R¹⁰, CON(R¹¹)(R¹²) or P(=O)(R¹³)(R¹⁴); or C₁–C₄ alkyl, C₂–C₄ alkenyl, C₁–C₄ haloalkyl, C₂–C₄ haloalkenyl, C₂–C₄ alkoxyalkyl, C₃–C₆ cycloalkyl or C₄–C₇ cycloalkylalkyl;

R⁹ and R¹¹ are independently H, C₁–C₇ alkyl or C₃–C₇ alkenyl; or phenyl, benzyl, each phenyl or benzyl optionally substituted by halogen, C₁–C₄ alkyl or C₁–C₄ haloalkyl;

25 R¹⁰ is C₁–C₇ alkyl or C₃–C₇ cycloalkyl; or phenyl or benzyl, each phenyl or benzyl optionally substituted by halogen, C₁–C₄ alkyl or C₁–C₄ haloalkyl;

R¹² is H, C₁–C₇ alkyl or C₃–C₇ cycloalkyl;

R¹³ is C₁–C₂ alkyl or C₁–C₂ alkoxy; and

30 R¹⁴ is C₁–C₂ alkyl or C₁–C₂ alkoxy.

Embodiment C. A compound of Embodiment B wherein

R¹ is H, C₁–C₇ alkyl, C₄–C₇ alkylcycloalkyl, C₃–C₇ cycloalkyl, C₄–C₇ cycloalkylalkyl or C₂–C₇ alkoxyalkyl;

35 R² is H, halogen, cyano, C₁–C₇ alkyl, C₂–C₇ haloalkoxyalkyl, C₁–C₇ haloalkyl, C₂–C₇ alkoxyalkyl, C₁–C₇ alkoxy or C₁–C₅ alkylthio;

each R³ is independently H, halogen, methyl, ethyl, CF₃ or -OCHF₂;

R⁴ is H, halogen, methyl, ethyl or CF₃;

G is H, C(=O)R⁹, CO₂R¹⁰ or P(=O)(R¹³)(R¹⁴); or C₁–C₄ alkyl, C₁–C₄ haloalkyl, C₂–C₄ alkoxyalkyl or C₃–C₆ cycloalkyl;

R⁹ is H or C₁–C₇ alkyl; or benzyl optionally substituted by halogen, C₁–C₄ alkyl or C₁–C₄ haloalkyl; and

5 R¹⁰ is C₁–C₇ alkyl; or phenyl optionally substituted by halogen, C₁–C₄ alkyl or C₁–C₄ haloalkyl.

Embodiment D. A compound of Embodiment C wherein

R¹ is H, C₁–C₇ alkyl, C₃–C₇ cycloalkyl, C₄–C₇ cycloalkylalkyl or C₂–C₇ alkoxyalkyl;

R² is H, halogen, cyano, C₁–C₇ alkyl, C₁–C₇ haloalkyl or C₁–C₇ alkoxy;

10 each R³ is independently H, F, Cl, Br or methyl;

R⁴ is H, F, Cl, Br or methyl;

R⁵ is H or methyl;

R⁶ is H or methyl;

R⁷ is H or methyl;

15 R⁸ is H or methyl;

G is H, C(=O)R⁹ or CO₂R¹⁰; or C₂–C₄ alkoxyalkyl or C₃–C₆ cycloalkyl;

R⁹ is C₁–C₇ alkyl; or benzyl optionally substituted by halogen, C₁–C₄ alkyl or C₁–C₄ haloalkyl; and

R¹⁰ is CH₃, CH₂CH₃, CH₂CH₂CH₃, Ph, Ph(4-Cl), Ph(3-CF₃) or Ph(4-CF₃).

20 Embodiment E. A compound of Embodiment D wherein

W is –C(R⁷)(R⁸)–;

R¹ is H, C₁–C₇ alkyl, C₃–C₇ cycloalkyl or C₂–C₇ alkoxyalkyl;

R² is H, Cl, Br, I, cyano, methyl, CF₃ or methoxy;

n is 0;

25 R⁴ is methyl;

R⁵ is H;

R⁶ is H;

R⁷ is H;

R⁸ is H; and

30 G is H.

Embodiment F. A compound of Embodiment D wherein

W is –O–;

R¹ is H or C₁–C₇ alkyl;

R² is H, Cl, methyl or methoxy;

35 n is 0;

R⁴ is methyl;

R⁵ is H;

R⁶ is H; and

G is H.

Specific Embodiments of the Invention are the following compounds of the Summary of the Invention:

- 4-(3,4-dihydro-2-methyl-1-naphthalenyl)-5-hydroxy-2,6-dimethyl-3-(2*H*)-
5 pyridazinone; and
5-hydroxy-2,6-dimethyl-4-(3-methyl-2*H*-1-benzopyran-4-yl)-3-(2*H*)-pyridazinone.

This invention also relates to a method for controlling undesired vegetation comprising applying to the locus of the vegetation herbicidally effective amounts of the compounds of the invention (e.g., as a composition described herein). Of note as embodiments relating to
10 methods of use are those involving the compounds of embodiments described above. Compounds of the invention are particularly useful for selective control of weeds in crops such as wheat, barley, maize, soybean, sunflower, cotton, oilseed rape and rice, and specialty crops such as sugarcane, citrus, fruit and nut crops.

Also noteworthy as embodiments are herbicidal compositions of the present invention
15 comprising the compounds of embodiments described above.

This invention also includes a herbicidal mixture comprising (a) a compound selected from Formula 1, *N*-oxides, and salts thereof, and (b) at least one additional active ingredient selected from (b1) photosystem II inhibitors, (b2) acetohydroxy acid synthase (AHAS) inhibitors, (b3) acetyl-CoA carboxylase (ACCase) inhibitors, (b4) auxin mimics,
20 (b5) 5-enol-pyruvylshikimate-3-phosphate (EPSP) synthase inhibitors, (b6) photosystem I electron diverters, (b7) protoporphyrinogen oxidase (PPO) inhibitors, (b8) glutamine synthetase (GS) inhibitors, (b9) very long chain fatty acid (VLCFA) elongase inhibitors, (b10) auxin transport inhibitors, (b11) phytoene desaturase (PDS) inhibitors, (b12) 4-hydroxyphenyl-pyruvate dioxygenase (HPPD) inhibitors, (b13) homogentisate
25 solenyltransferase (HST) inhibitors, (b14) cellulose biosynthesis inhibitors, (b15) other herbicides including mitotic disruptors, organic arsenicals, asulam, bromobutide, cinmethylin, cumyluron, dazomet, 2-[(2,4-dichlorophenyl)methyl]-4,4-dimethyl-3-isoxazolidinone, difenzoquat, dymron, etobenzanid, flurenol, fosamine, fosamine-ammonium, hydantocidin, metam, methyldymron, oleic acid, oxaziclomefone,
30 pelargonic acid and pyributicarb, and (b16) herbicide safeners; and salts of compounds of (b1) through (b16).

“Photosystem II inhibitors” (b1) are chemical compounds that bind to the D-1 protein at the Q_B-binding niche and thus block electron transport from Q_A to Q_B in the chloroplast thylakoid membranes. The electrons blocked from passing through photosystem II are
35 transferred through a series of reactions to form toxic compounds that disrupt cell membranes and cause chloroplast swelling, membrane leakage, and ultimately cellular destruction. The Q_B-binding niche has three different binding sites: binding site A binds the triazines such as atrazine, triazinones such as hexazinone, and uracils such as bromacil,

binding site B binds the phenylureas such as diuron, and binding site C binds benzothiadiazoles such as bentazon, nitriles such as bromoxynil and phenyl-pyridazines such as pyridate. Examples of photosystem II inhibitors include ametryn, amicarbazone, atrazine, bentazon, bromacil, bromofenoxim, bromoxynil, chlorbromuron, chloridazon, chlorotoluron, chloroxuron, cumyluron, cyanazine, daimuron, desmedipham, desmetryn, dimefuron, dimethametryn, diuron, ethidimuron, fenuron, fluometuron, hexazinone, ioxynil, isoproturon, isouron, lenacil, linuron, metamiltron, methabenzthiazuron, metobromuron, metoxuron, metribuzin, monolinuron, neburon, pentanochlor, phenmedipham, prometon, prometryn, propanil, propazine, pyridafol, pyridate, siduron, simazine, simetryn, tebuthiuron, terbacil, terbumeton, terbuthylazine, terbutryn and trietazine.

“AHAS inhibitors” (b2) are chemical compounds that inhibit acetohydroxy acid synthase (AHAS), also known as acetolactate synthase (ALS), and thus kill plants by inhibiting the production of the branched-chain aliphatic amino acids such as valine, leucine and isoleucine, which are required for protein synthesis and cell growth. Examples of AHAS inhibitors include amidosulfuron, azimsulfuron, bensulfuron-methyl, bispyribac-sodium, cloransulam-methyl, chlorimuron-ethyl, chlorsulfuron, cinosulfuron, cyclosulfamuron, diclosulam, ethametsulfuron-methyl, ethoxysulfuron, flazasulfuron, florasulam, flucarbazone-sodium, flumetsulam, flupyrsulfuron-methyl, flupyrsulfuron-sodium, foramsulfuron, halosulfuron-methyl, imazamethabenz-methyl, imazamox, imazapic, imazapyr, imazaquin, imazethapyr, imazosulfuron, iodosulfuron-methyl (including sodium salt), iofensulfuron (2-iodo-*N*-[(4-methoxy-6-methyl-1,3,5-triazin-2-yl)amino]carbonyl]benzenesulfonamide), mesosulfuron-methyl, metazosulfuron (3-chloro-4-(5,6-dihydro-5-methyl-1,4,2-dioxazin-3-yl)-*N*-[(4,6-dimethoxy-2-pyrimidinyl)amino]carbonyl]-1-methyl-1*H*-pyrazole-5-sulfonamide), metosulam, metsulfuron-methyl, nicosulfuron, oxasulfuron, penoxsulam, primisulfuron-methyl, propoxycarbazone-sodium, propyrisulfuron (2-chloro-*N*-[(4,6-dimethoxy-2-pyrimidinyl)amino]carbonyl]-6-propylimidazo[1,2-*b*]pyridazine-3-sulfonamide), prosulfuron, pyrazosulfuron-ethyl, pyribenzoxim, pyriftalid, pyriminobac-methyl, pyrithiobac-sodium, rimsulfuron, sulfometuron-methyl, sulfosulfuron, thiencarbazone, thifensulfuron-methyl, triafamone (*N*-[2-[(4,6-dimethoxy-1,3,5-triazin-2-yl)carbonyl]-6-fluorophenyl]-1,1-difluoro-*N*-methylmethanesulfonamide), triasulfuron, tribenuron-methyl, trifloxysulfuron (including sodium salt), triflusulfuron-methyl and tritosulfuron.

“ACCase inhibitors” (b3) are chemical compounds that inhibit the acetyl-CoA carboxylase enzyme, which is responsible for catalyzing an early step in lipid and fatty acid synthesis in plants. Lipids are essential components of cell membranes, and without them, new cells cannot be produced. The inhibition of acetyl CoA carboxylase and the subsequent lack of lipid production leads to losses in cell membrane integrity, especially in regions of active growth such as meristems. Eventually shoot and rhizome growth ceases, and shoot

meristems and rhizome buds begin to die back. Examples of ACCase inhibitors include alloxydim, butroxydim, clethodim, clodinafop, cycloxydim, cyhalofop, diclofop, fenoxaprop, fluazifop, haloxyfop, pinoxaden, profoxydim, propaquizafop, quizalofop, sethoxydim, tepraloxydim and tralkoxydim, including resolved forms such as fenoxaprop-P, fluazifop-P, haloxyfop-P and quizalofop-P and ester forms such as clodinafop-propargyl, cyhalofop-butyl, diclofop-methyl and fenoxaprop-P-ethyl.

Auxin is a plant hormone that regulates growth in many plant tissues. “Auxin mimics” (b4) are chemical compounds mimicking the plant growth hormone auxin, thus causing uncontrolled and disorganized growth leading to plant death in susceptible species. Examples of auxin mimics include aminocyclopyrachlor (6-amino-5-chloro-2-cyclopropyl-4-pyrimidinecarboxylic acid) and its methyl and ethyl esters and its sodium and potassium salts, aminopyralid, benazolin-ethyl, chloramben, clacyfos, clomeprop, clopyralid, dicamba, 2,4-D, 2,4-DB, dichlorprop, fluroxypyr, halauxifen (4-amino-3-chloro-6-(4-chloro-2-fluoro-3-methoxyphenyl)-2-pyridinecarboxylic acid), halauxifen-methyl (methyl 4-amino-3-chloro-6-(4-chloro-2-fluoro-3-methoxyphenyl)-2-pyridinecarboxylate), MCPA, MCPB, mecoprop, picloram, quinclorac, quinmerac, 2,3,6-TBA, triclopyr, and methyl 4-amino-3-chloro-6-(4-chloro-2-fluoro-3-methoxyphenyl)-5-fluoro-2-pyridinecarboxylate.

“EPSP synthase inhibitors” (b5) are chemical compounds that inhibit the enzyme, 5-enol-pyruvylshikimate-3-phosphate synthase, which is involved in the synthesis of aromatic amino acids such as tyrosine, tryptophan and phenylalanine. EPSP inhibitor herbicides are readily absorbed through plant foliage and translocated in the phloem to the growing points. Glyphosate is a relatively nonselective postemergence herbicide that belongs to this group. Glyphosate includes esters and salts such as ammonium, isopropylammonium, potassium, sodium (including sesquisodium) and trimesium (alternatively named sulfosate).

“Photosystem I electron diverters” (b6) are chemical compounds that accept electrons from Photosystem I, and after several cycles, generate hydroxyl radicals. These radicals are extremely reactive and readily destroy unsaturated lipids, including membrane fatty acids and chlorophyll. This destroys cell membrane integrity, so that cells and organelles “leak”, leading to rapid leaf wilting and desiccation, and eventually to plant death. Examples of this second type of photosynthesis inhibitor include diquat and paraquat.

“PPO inhibitors” (b7) are chemical compounds that inhibit the enzyme protoporphyrinogen oxidase, quickly resulting in formation of highly reactive compounds in plants that rupture cell membranes, causing cell fluids to leak out. Examples of PPO inhibitors include acifluorfen-sodium, azafenidin, benzfendizone, bifenox, butafenacil, carfentrazone, carfentrazone-ethyl, chlomethoxyfen, cinidon-ethyl, cyclopyranil, fluazolate, flufenpyr-ethyl, flumiclorac-pentyl, flumioxazin, fluoroglycofen-ethyl, fluthiacet-methyl, fomesafen, halosafen, lactofen, oxadiargyl, oxadiazon, oxyfluorfen, pentoxazone, proflumazone,

pyraclostrobin, pyraflufen-ethyl, saflufenacil, sulfentrazone, thidiazimin, trifludimoxazin (dihydro-1,5-dimethyl-6-thioxo-3-[2,2,7-trifluoro-3,4-dihydro-3-oxo-4-(2-propyn-1-yl)-2*H*-1,4-benzoxazin-6-yl]-1,3,5-triazine-2,4(1*H*,3*H*)-dione) and tiafenacil (methyl *N*-[2-[[2-chloro-5-[3,6-dihydro-3-methyl-2,6-dioxo-4-(trifluoromethyl)-1(2*H*)-pyrimidinyl]-4-fluorophenyl]thio]-1-oxopropyl]-β-alaninate).

“GS inhibitors” (b8) are chemical compounds that inhibit the activity of the glutamine synthetase enzyme, which plants use to convert ammonia into glutamine. Consequently, ammonia accumulates and glutamine levels decrease. Plant damage probably occurs due to the combined effects of ammonia toxicity and deficiency of amino acids required for other metabolic processes. The GS inhibitors include glufosinate and its esters and salts such as glufosinate-ammonium and other phosphinothricin derivatives, glufosinate-P ((2*S*)-2-amino-4-(hydroxymethylphosphinyl)butanoic acid) and bilanaphos.

“VLCFA elongase inhibitors” (b9) are herbicides having a wide variety of chemical structures, which inhibit the elongase. Elongase is one of the enzymes located in or near chloroplasts which are involved in biosynthesis of VLCFAs. In plants, very-long-chain fatty acids are the main constituents of hydrophobic polymers that prevent desiccation at the leaf surface and provide stability to pollen grains. Such herbicides include acetochlor, alachlor, anilofos, butachlor, cafenstrole, dimethachlor, dimethenamid, diphenamid, fenoxasulfone (3-[[[(2,5-dichloro-4-ethoxyphenyl)methyl]sulfonyl]-4,5-dihydro-5,5-dimethylisoxazole), fentrazamide, flufenacet, indanofan, mefenacet, metazachlor, metolachlor, naproanilide, napropamide, napropamide-M ((2*R*)-*N,N*-diethyl-2-(1-naphthalenyloxy)propanamide), pethoxamid, piperophos, pretilachlor, propachlor, propisochlor, pyroxasulfone, and thenylchlor, including resolved forms such as *S*-metolachlor and chloroacetamides and oxyacetamides.

“Auxin transport inhibitors” (b10) are chemical substances that inhibit auxin transport in plants, such as by binding with an auxin-carrier protein. Examples of auxin transport inhibitors include diflufenzopyr, naptalam (also known as *N*-(1-naphthyl)phthalamic acid and 2-[(1-naphthalenylamino)carbonyl]benzoic acid).

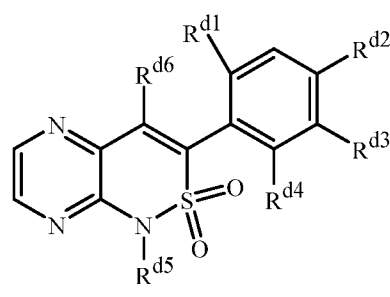
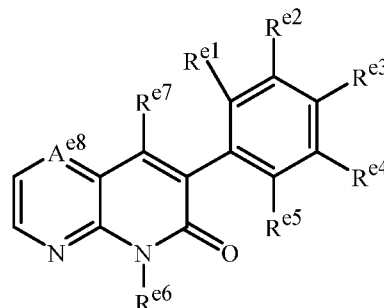
“PDS inhibitors” (b11) are chemical compounds that inhibit carotenoid biosynthesis pathway at the phytoene desaturase step. Examples of PDS inhibitors include beflubutamid, *S*-beflubutamid, diflufenican, fluridone, flurochloridone, flurtamone norflurzon and picolinafen.

“HPPD inhibitors” (b12) are chemical substances that inhibit the biosynthesis of synthesis of 4-hydroxyphenyl-pyruvate dioxygenase. Examples of HPPD inhibitors include benzobicyclon, benzofenap, bicyclopyrone (4-hydroxy-3-[[2-[(2-methoxyethoxy)methyl]-6-(trifluoromethyl)-3-pyridinyl]carbonyl]bicyclo[3.2.1]oct-3-en-2-one), fenquinotrine (2-[[8-chloro-3,4-dihydro-4-(4-methoxyphenyl)-3-oxo-2-quinoxaliny]carbonyl]-1,3-cyclohexanedione), isoxachlortole, isoxaflutole, mesotrione, pyrasulfotole, pyrazolynate,

pyrazoxyfen, sulcotrione, tefuryltrione, tembotrione, tolypyralate (1-[[1-ethyl-4-[3-(2-methoxyethoxy)-2-methyl-4-(methylsulfonyl)benzoyl]-1H-pyrazol-5-yl]oxy]ethyl methyl carbonate), topramezone, 5-chloro-3-[(2-hydroxy-6-oxo-1-cyclohexen-1-yl)carbonyl]-1-(4-methoxyphenyl)-2(1*H*)-quinoxalinone, 4-(2,6-diethyl-4-methylphenyl)-5-hydroxy-2,6-dimethyl-3(2*H*)-pyridazinone, 4-(4-fluorophenyl)-6-[(2-hydroxy-6-oxo-1-cyclohexen-1-yl)carbonyl]-2-methyl-1,2,4-triazine-3,5(2*H*,4*H*)-dione, 5-[(2-hydroxy-6-oxo-1-cyclohexen-1-yl)carbonyl]-2-(3-methoxyphenyl)-3-(3-methoxypropyl)-4(3*H*)-pyrimidinone, 2-methyl-*N*-(4-methyl-1,2,5-oxadiazol-3-yl)-3-(methylsulfinyl)-4-(trifluoromethyl)benzamide and 2-methyl-3-(methylsulfonyl)-*N*-(1-methyl-1*H*-tetrazol-5-yl)-4-(trifluoromethyl)benzamide.

“HST inhibitors” (b13) disrupt a plant’s ability to convert homogentisate to 2-methyl-6-solanyl-1,4-benzoquinone, thereby disrupting carotenoid biosynthesis. Examples of HST inhibitors include haloxydine, pyriclor, 3-(2-chloro-3,6-difluorophenyl)-4-hydroxy-1-methyl-1,5-naphthyridin-2(1*H*)-one, 7-(3,5-dichloro-4-pyridinyl)-5-(2,2-difluoroethyl)-8-hydroxypyrido[2,3-*b*]pyrazin-6(5*H*)-one and 4-(2,6-diethyl-4-methylphenyl)-5-hydroxy-2,6-dimethyl-3(2*H*)-pyridazinone.

HST inhibitors also include compounds of Formulae **A** and **B**.

**A****B**

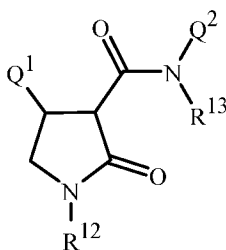
wherein R^{d1} is H, Cl or CF_3 ; R^{d2} is H, Cl or Br; R^{d3} is H or Cl; R^{d4} is H, Cl or CF_3 ; R^{d5} is CH_3 , CH_2CH_3 or CH_2CHF_2 ; and R^{d6} is OH, or $-OC(=O)-i\text{-Pr}$; and R^{e1} is H, F, Cl, CH_3 or CH_2CH_3 ; R^{e2} is H or CF_3 ; R^{e3} is H, CH_3 or CH_2CH_3 ; R^{e4} is H, F or Br; R^{e5} is Cl, CH_3 , CF_3 , OCF_3 or CH_2CH_3 ; R^{e6} is H, CH_3 , CH_2CHF_2 or $C\equiv CH$; R^{e7} is OH, $-OC(=O)Et$, $-OC(=O)-i\text{-Pr}$ or $-OC(=O)-t\text{-Bu}$; and A^{e8} is N or CH.

“Cellulose biosynthesis inhibitors” (b14) inhibit the biosynthesis of cellulose in certain plants. They are most effective when applied preemergence or early postemergence on young or rapidly growing plants. Examples of cellulose biosynthesis inhibitors include chlorthiamid, dichlobenil, flupoxam, indaziflam (N^2 -[(1*R*,2*S*)-2,3-dihydro-2,6-dimethyl-1*H*-inden-1-yl]-6-(1-fluoroethyl)-1,3,5-triazine-2,4-diamine), isoxaben, [3-(3,5-dichlorophenyl)-1*H*-pyrazol-4-yl]phenyl-methanone and triaziflam.

“Other herbicides” (b15) include herbicides that act through a variety of different modes of action such as mitotic disruptors (e.g., flumprop-M-methyl and

flamprop-M-isopropyl), organic arsenicals (e.g., DSMA, and MSMA), 7,8-dihydropteroate synthase inhibitors, chloroplast isoprenoid synthesis inhibitors and cell-wall biosynthesis inhibitors. Other herbicides include those herbicides having unknown modes of action or do not fall into a specific category listed in (b1) through (b14) or act through a combination of modes of action listed above. Examples of other herbicides include aclonifen, asulam, amitrole, bromobutide, cinmethylin, clomazone, cumyluron, daimuron, 2-[(2,4-dichlorophenyl)methyl]-4,4-dimethyl-3-isoxazolidinone, difenzoquat, etobenzanid, fluometuron, flurenol, fosamine, fosamine-ammonium, dazomet, dymron, ipfencarbazone (1-(2,4-dichlorophenyl)-*N*-(2,4-difluorophenyl)-1,5-dihydro-*N*-(1-methylethyl)-5-oxo-4*H*-1,2,4-triazole-4-carboxamide), metam, methyl dymron, oleic acid, oxaziclomefone, pelargonic acid, pyributicarb and 5-[[[(2,6-difluorophenyl)methoxy]methyl]-4,5-dihydro-5-methyl-3-(3-methyl-2-thienyl)isoxazole.

“Other herbicides” (b15) also include a compound of Formula (b15A)



(b15A)

wherein

R^{12} is H, C_1-C_6 alkyl, C_1-C_6 haloalkyl or C_4-C_8 cycloalkyl;

R^{13} is H, C_1-C_6 alkyl or C_1-C_6 alkoxy;

Q^1 is an optionally substituted ring system selected from the group consisting of phenyl, thienyl, pyridinyl, benzodioxolyl, naphthyl, naphthalenyl, benzofuranyl, furanyl, benzothiophenyl and pyrazolyl, wherein when substituted said ring system is substituted by 1 to 3 R^{14} ;

Q^2 is an optionally substituted ring system selected from the group consisting of phenyl, pyridinyl, benzodioxolyl, pyridinonyl, thiadiazolyl, thiazolyl, and oxazolyl, wherein when substituted said ring system is substituted by 1 to 3 R^{15} ;

each R^{14} is independently halogen, C_1-C_6 alkyl, C_1-C_6 haloalkyl, C_1-C_6 alkoxy, C_1-C_6 haloalkoxy, C_3-C_8 cyaloalkyl, cyano, C_1-C_6 alkylthio, C_1-C_6 alkylsulfinyl, C_1-C_6 alkylsulfonyl, SF_5 , NHR^{17} ; or phenyl optionally substituted by 1 to 3 R^{16} ; or pyrazolyl optionally substituted by 1 to 3 R^{16} ;

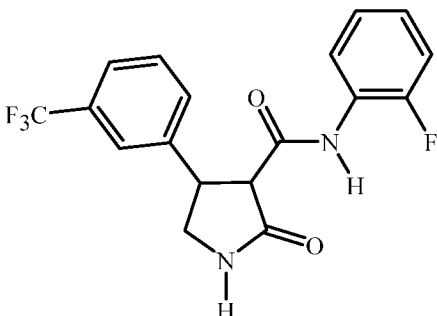
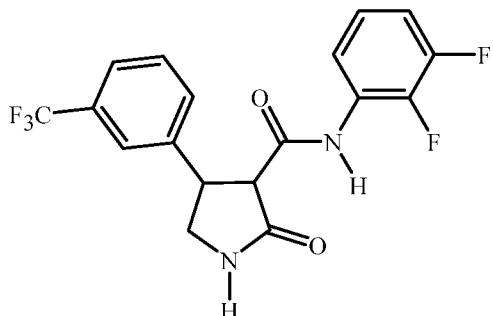
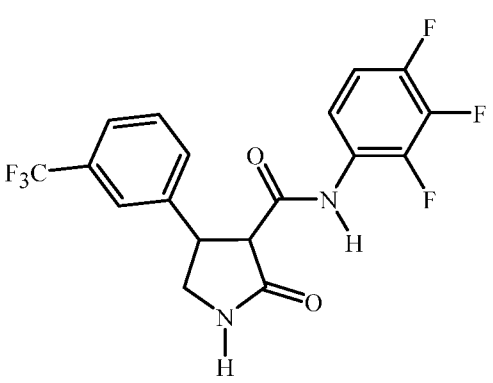
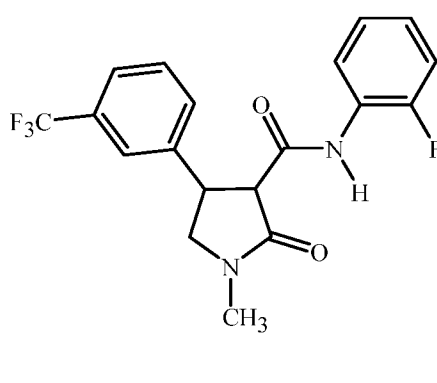
each R^{15} is independently halogen, C_1-C_6 alkyl, C_1-C_6 haloalkyl, C_1-C_6 alkoxy, C_1-C_6 haloalkoxy, cyano, nitro, C_1-C_6 alkylthio, C_1-C_6 alkylsulfinyl, C_1-C_6 alkylsulfonyl;

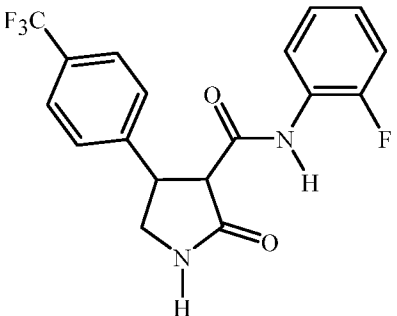
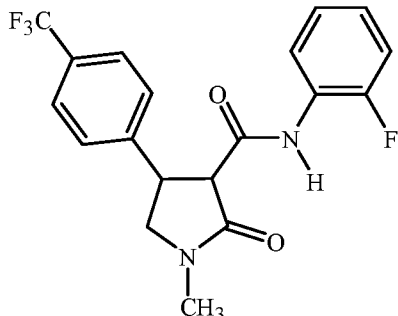
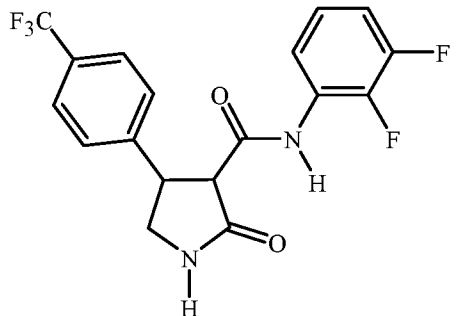
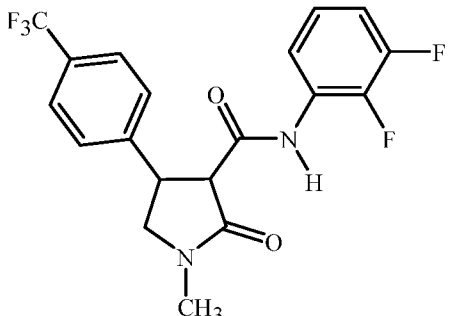
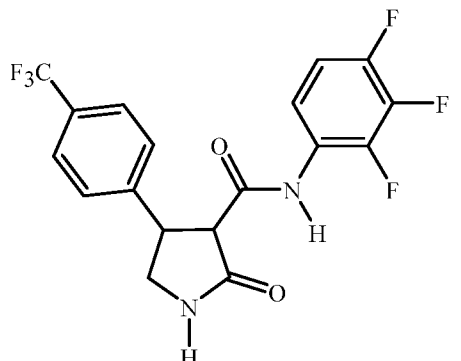
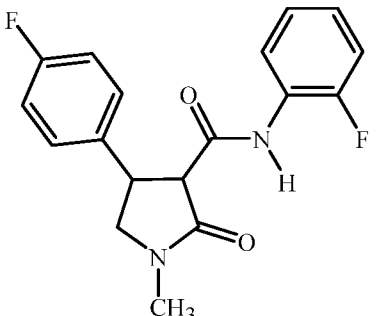
each R^{16} is independently halogen, C_1-C_6 alkyl or C_1-C_6 haloalkyl;

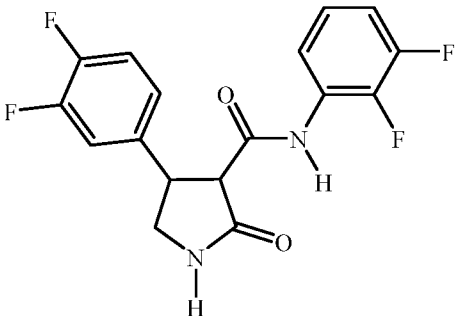
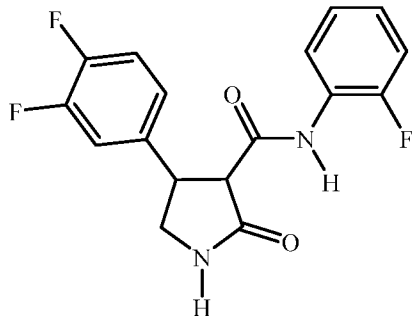
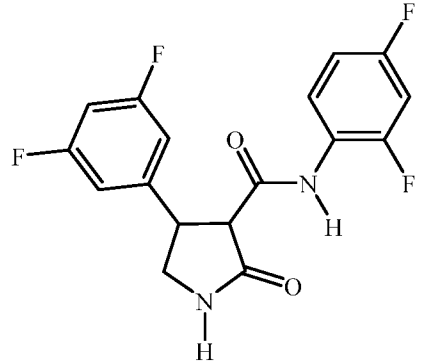
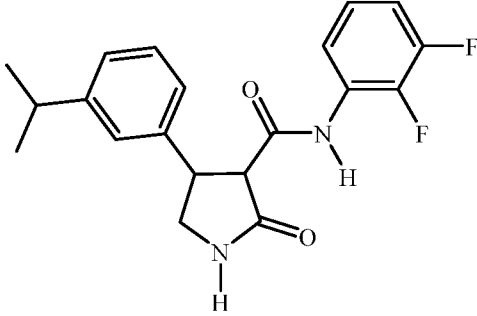
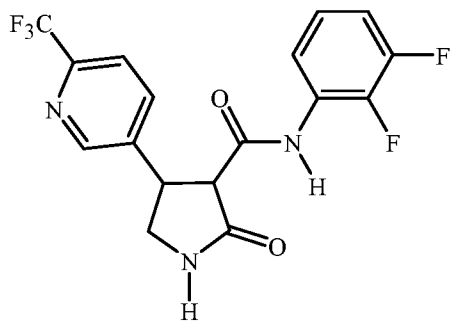
R^{17} is C_1-C_4 alkoxy carbonyl.

In one Embodiment wherein “other herbicides” (b15) also include a compound of Formula (b15A), it is preferred that R^{12} is H or C_1-C_6 alkyl; more preferably R^{12} is H or methyl.

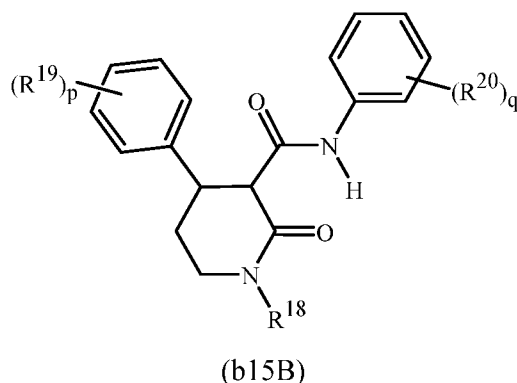
- 5 Preferably R^{13} is H. Preferably Q^1 is either a phenyl ring or a pyridinyl ring, each ring substituted by 1 to 3 R^{14} ; more preferably Q^1 is a phenyl ring substituted by 1 to 2 R^{14} . Preferably Q^2 is a phenyl ring substituted by 1 to 3 R^{15} ; more preferably Q^2 is a phenyl ring substituted by 1 to 2 R^{15} . Preferably each R^{14} is independently halogen, C_1-C_4 alkyl, C_1-C_3 haloalkyl, C_1-C_3 alkoxy or C_1-C_3 haloalkoxy; more preferably each R^{14} is
- 10 independently chloro, fluoro, bromo, C_1-C_2 haloalkyl, C_1-C_2 haloalkoxy or C_1-C_2 alkoxy. Preferably each R^{15} is independently halogen, C_1-C_4 alkyl, C_1-C_3 haloalkoxy; more preferably each R^{15} is independently chloro, fluoro, bromo, C_1-C_2 haloalkyl, C_1-C_2 haloalkoxy or C_1-C_2 alkoxy. Specifically preferred as “other herbicides” (b15) include any one of the following (b15A-1) through (b15A-15) wherein the stereochemistry at the 3- and
- 15 4- positions of the pyrrolidinone ring are preferably in the *trans* configuration relative to each other:

	
(b15A-1),	(b15A-2),
	
(b15A-3),	(b15A-4),

	
(b15A-5),	(b15A-6),
	
(b15A-7),	(b15A-8),
	
(b15A-9),	(b15A-10),

	
(b15A-11),	(b15A-12),
	
(b15A-13),	(b15A-14) and
	
(b15A-15)	.

“Other herbicides” (b15) also include a compound of Formula (b15B)



wherein

R^{18} is H, C_1 – C_6 alkyl, C_1 – C_6 haloalkyl or C_4 – C_8 cycloalkyl;

5 each R^{19} is independently halogen, C_1 – C_6 haloalkyl or C_1 – C_6 haloalkoxy;

p is an integer of 0, 1, 2 or 3;

each R^{20} is independently halogen, C_1 – C_6 haloalkyl or C_1 – C_6 haloalkoxy; and

q is an integer of 0, 1, 2 or 3.

In one Embodiment wherein “other herbicides” (b15) also include a compound of Formula (b15B), it is preferred that R^{18} is H, methyl, ethyl or propyl; more preferably R^{18} is H or methyl; most preferably R^{18} is H. Preferably each R^{19} is independently chloro, fluoro, C_1 – C_3 haloalkyl or C_1 – C_3 haloalkoxy; more preferably each R^{19} is independently chloro, fluoro, C_1 fluoroalkyl (i.e. fluoromethyl, difluoromethyl or trifluoromethyl) or C_1 fluoroalkoxy (i.e. trifluoromethoxy, difluoromethoxy or fluoromethoxy). Preferably each R^{20} is independently chloro, fluoro, C_1 haloalkyl or C_1 haloalkoxy; more preferably each R^{20} is independently chloro, fluoro, C_1 fluoroalkyl (i.e. fluoromethyl, difluoromethyl or trifluoromethyl) or C_1 fluoroalkoxy (i.e. trifluoromethoxy, difluoromethoxy or fluoromethoxy). Specifically preferred as “other herbicides” (b15) include any one of the following (b15B-1) through (b15B-19):

20 (b15B-1) 2-oxo-N-[2-(trifluoromethyl)phenyl]-4-(3,4-difluorophenyl)-3-piperidinecarboxamide,

(b15B-2) N-(2,3-difluorophenyl)-2-oxo-4-[3-(trifluoromethyl)phenyl]-3-piperidinecarboxamide,

25 (b15B-3) 2-oxo-N-[2-(trifluoromethyl)phenyl]-4-[3-(trifluoromethyl)phenyl]-3-piperidinecarboxamide,

(b15B-4) N-(2-chlorophenyl)-2-oxo-4-[4-(trifluoromethyl)phenyl]-3-piperidinecarboxamide,

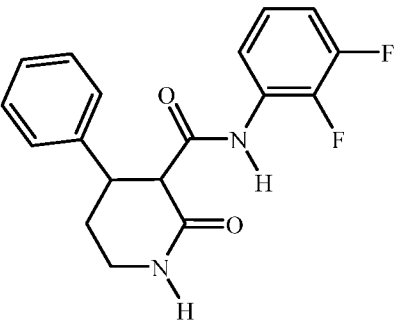
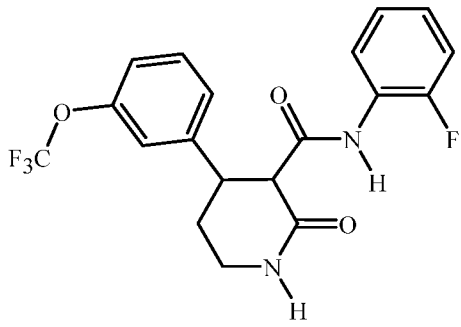
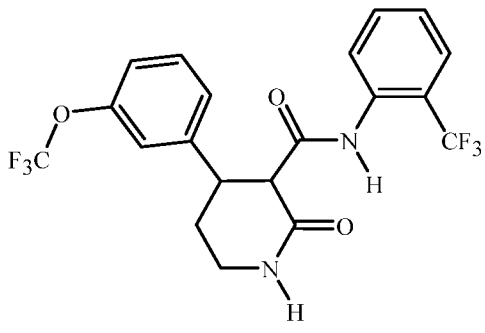
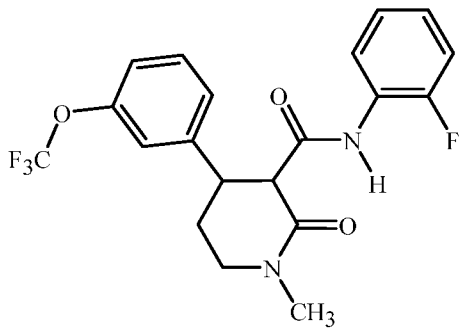
(b15B-5) N-(2-fluorophenyl)-2-oxo-4-[4-(trifluoromethyl)phenyl]-3-piperidinecarboxamide,

(b15B-6) (3*R*,4*S*)-N-(2,3-difluorophenyl)-2-oxo-4-[3-(trifluoromethyl)phenyl]-3-piperidinecarboxamide,

(b15B-7) (3*R*,4*S*)-*N*-(2,3-difluorophenyl)-2-oxo-4-[4-(trifluoromethyl)phenyl]-3-piperidinecarboxamide,

(b15B-8) (3*R*,4*S*)-*N*-(3-chloro-2-fluorophenyl)-2-oxo-4-[3-(trifluoromethyl)phenyl]-3-piperidinecarboxamide,

5 (b15B-9) (3*R*,4*S*)-2-oxo-4-[3-(trifluoromethyl)phenyl]-*N*-[2,3,4-trifluorophenyl]-3-piperidinecarboxamide,

	
(b15B-10),	(b15B-11),
	
(b15B-12),	(b15B-13),

(b15B-14) (3*R*,4*S*)-4-(3-chlorophenyl)-*N*-(2,3-difluorophenyl)-2-oxo-3-piperidinecarboxamide,

(b15B-15) 4-[3-(difluoromethyl)phenyl]-*N*-(2,3,4-trifluorophenyl)-2-oxo-piperidinecarboxamide,

10

(b15B-16) 4-[3-(difluoromethyl)phenyl]-*N*-(2-fluorophenyl)-2-oxo-piperidinecarboxamide,

(b15B-17) 4-[3-(difluoromethyl)phenyl]-*N*-(2,3-difluorophenyl)-2-oxo-3-piperidinecarboxamide,

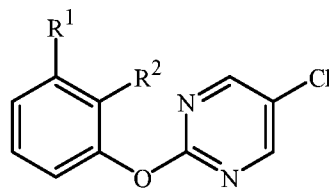
(b15B-18) (3*S*,4*S*)-*N*-(2,3-difluorophenyl)-4-(4-fluorophenyl)-1-methyl-2-oxo-3-piperidinecarboxamide and

15

(b15B-19) (3*R*,4*S*)-2-oxo-*N*-[2-(trifluoromethyl)phenyl]-4-(4-fluorophenyl)-3-piperidinecarboxamide.

“Other herbicides” (b15) also include a compound of Formula (b15C),

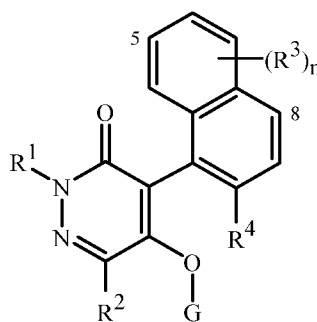
33



(b15C)

wherein R^1 is Cl, Br or CN; and R^2 is $C(=O)CH_2CH_2CF_3$, $CH_2CH_2CH_2CH_2CF_3$ or 3- CHF_2 -isoxazol-5-yl.

“Other herbicides” (b15) also include a compound of Formula (b15D)



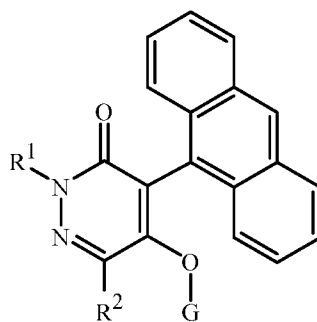
(b15D)

5

wherein R^1 is CH_3 , R^2 is Me, R^4 is $OCHF_2$, G is H, and n is 0; R^1 is CH_3 , R^2 is Me, R^3 is 5-F, R^4 is Cl, G is H, and n is 1; R^1 is CH_3 , R^2 is Cl, R^4 is Me, G is H, and n is 0; R^1 is CH_3 , R^2 is Me, R^4 is Cl, G is H, and n is 0; R^1 is CH_3 , R^2 is Me, R^3 is 5-Me, R^4 is $OCHF_2$, G is H, and n is 1; R^1 is CH_3 , R^2 is Me, R^3 is 5-Br, R^4 is $OCHF_2$, G is H, and n is 1; R^1 is CH_3 , R^2 is Me, R^3 is 5-Cl, R^4 is Cl, G is H, and n is 1; and R^1 is CH_3 , R^2 is CH_3 , R^4 is $OCHF_2$, G is $C(O)Me$, and n is 0.

10

“Other herbicides” (b15) also include a compound of Formula (b15E)



(b15E)

wherein

R^1 is CH_3 , R^2 is Cl, and G is H; and
 R^1 is CH_3 , R^2 is Cl, and G is $C(O)Me$.

15

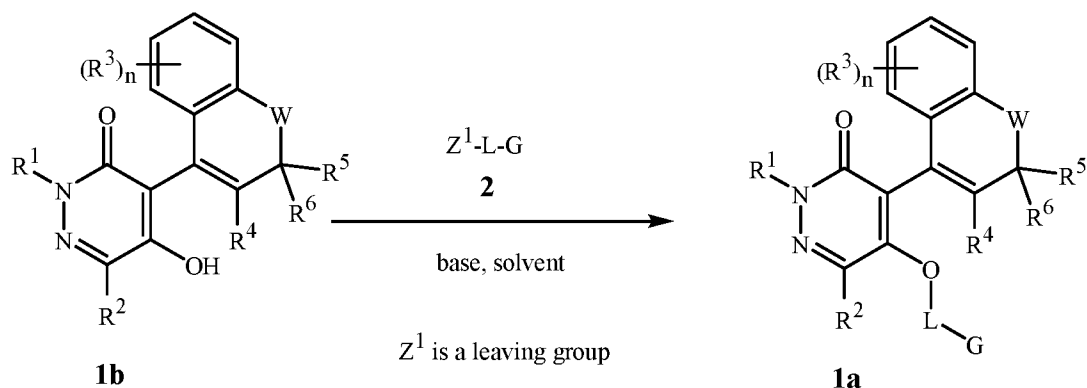
“Herbicide safeners” (b16) are substances added to a herbicide formulation to eliminate or reduce phytotoxic effects of the herbicide to certain crops. These compounds protect crops from injury by herbicides but typically do not prevent the herbicide from controlling undesired vegetation. Examples of herbicide safeners include but are not limited to benoxacor, cloquintocet-mexyl, cumyluron, cyometrinil, cyprosulfamide, daimuron, dichlormid, dicyclonon, dietholate, dimepiperate, fenchlorazole-ethyl, fencloirim, flurazole, fluxofenim, furilazole, isoxadifen-ethyl, mefenpyr-diethyl, mephenate, methoxyphenone, naphthalic anhydride, oxabetrinil, *N*-(aminocarbonyl)-2-methylbenzenesulfonamide and *N*-(aminocarbonyl)-2-fluorobenzenesulfonamide, 1-bromo-4-[(chloromethyl)sulfonyl]benzene, 2-(dichloromethyl)-2-methyl-1,3-dioxolane (MG 191), 4-(dichloroacetyl)-1-oxa-4-azospiro[4.5]decane (MON 4660), 2,2-dichloro-1-(2,2,5-trimethyl-3-oxazolidinyl)-ethanone and 2-methoxy-*N*-[[4-[(methylamino)carbonyl]amino]phenyl]sulfonyl]-benzamide.

The compounds of Formula **1** can be prepared by general methods known in the art of synthetic organic chemistry. One or more of the following methods and variations as described in Schemes 1–6 can be used to prepare a compound of Formula **1**. The definitions of W, R¹, R², R³, n, R⁴, R⁵, R⁶, L and G in the compounds of Formulae **1–8** below are as defined above in the Summary of the Invention unless otherwise noted. Compounds of Formulae **1a** and **1b** are various subsets of the compounds of Formula **1**, and all substituents for Formulae **1a** and **1b** are as defined above for Formula **1** unless otherwise noted.

As shown in Scheme 1, pyridazinones of Formula **1a** can be made by reacting substituted 5-hydroxy-3(2*H*)-pyridazinones of Formula **1b** with a suitable electrophilic reagent of Formula **2** in the presence of base in an appropriate solvent. Some examples of reagent classes representing Formula **2** wherein Z¹ is Cl and L is a direct bond include acid chlorides (G is -(C=O)R⁵), carboxylates (G is -CO₂R⁶), carbamoyl chlorides (G is -CONR⁷R⁸), sulfonyl chlorides (G is -S(O)₂R⁵) and chlorosulfonamides (G is -S(O)₂NR⁷R⁸). Examples of suitable bases for this reaction include, but are not limited to, potassium carbonate, sodium hydroxide, potassium hydroxide, sodium hydride or potassium *tert*-butoxide and, depending on the specific base used, appropriate solvents can be protic or aprotic and used anhydrous or as aqueous mixtures. Preferred solvents for this reaction include acetonitrile, methanol, ethanol, tetrahydrofuran, diethyl ether, 1,2-dimethoxyethane, dioxane, dichloromethane or *N,N*-dimethylformamide. The reaction can be performed at a range of temperatures, typically ranging from 0 °C to the reflux temperature of the solvent.

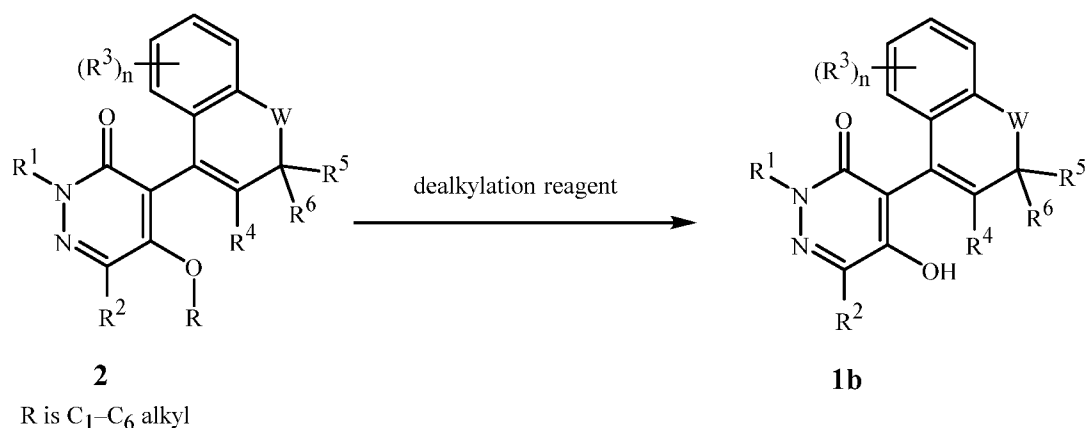
35

Scheme 1



As shown in Scheme 2 compounds of the Formula **1b** can be prepared via dealkylation of a compound of Formula **2**, where R is a lower alkyl group. Dealkylation reagents such as boron tribromide, lithium chloride, or morpholine are suitable for this transformation (see, for example, WO 2009/086041, WO 2013/160126 and WO 2013/050421).

Scheme 2

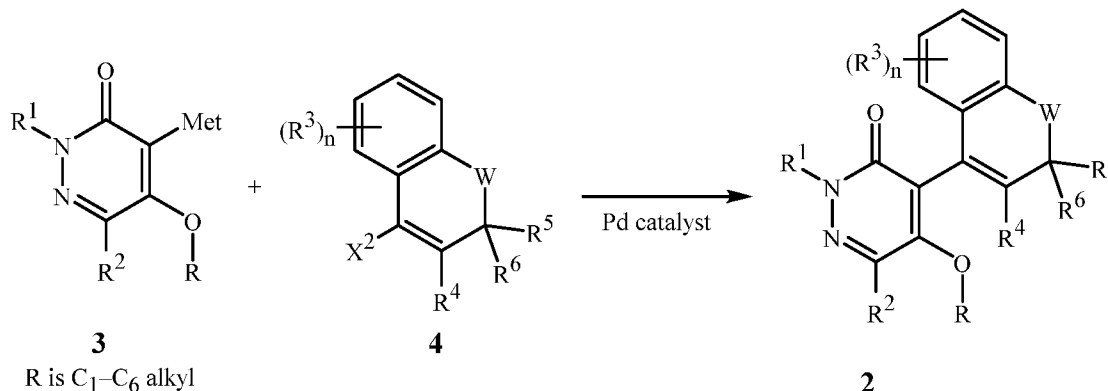


A compound of Formula **2** can be prepared by coupling reactions of organometallic pyridazinone coupling partners of Formula **3** with a saturated bicyclic halide and sulfonate of Formula **4** as is shown in Scheme 3. The organometallic coupling partner can be, for example, an organozinc, organomagnesium, organotin, or organoboron reagent. Palladium catalysts such as palladium tetrakis (triphenylphosphine) and those generated from other palladium sources, such as Pd₂dba₃ and Pd(OAc)₂, and a phosphine or N-heterocyclic carbene ligand can be used in the coupling procedures (Maes et al. *J. Org. Chem.* **2011**, 76, 9648-9659). Palladium precatalysts based on dialkyl biarylphosphine ligands, such as X-Phos, S-Phos and Ru-Phos (Buchwald et al. *Angew. Chem. Int. Ed.* **2013**, 52(2), 615-619.), or precatalysts derived from N-heterocyclic carbene ligands such as PEPPSI-*i*-Pr and PEPPSI-*i*-Pent (Organ et al. *Eur. J. Org. Chem.* **2010**, 4343-4354) can affect this coupling as

well. The reaction can be carried out in solvents such as tetrahydrofuran, dimethoxyethane, *N*-methyl-2-pyrrolidone and dioxane. Coupling partners may be either heterocyclic halides or sulfonates. A particularly useful class of coupling partners for the reaction are those based on nonaflates ($-\text{OSO}_2\text{C}_4\text{F}_9$) of saturated bicyclic compounds.

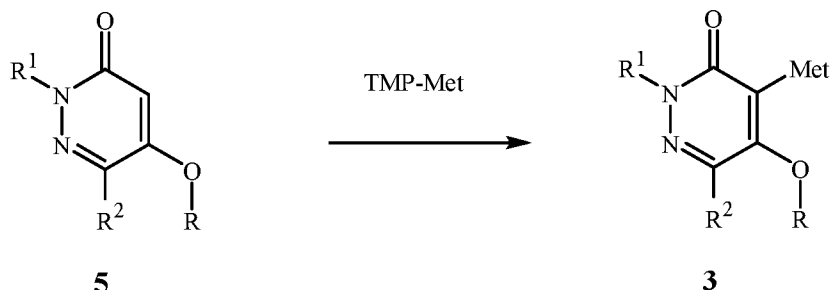
5

Scheme 3



As seen in Scheme 4 a compound of Formula **3** can be prepared by metalation at the 4-position of a pyridazinone of Formula **5**. Zincation can be accomplished with reagents such as 2,2,6,6-bis(tetramethylpiperidine)zinc, magnesium chloride, lithium chloride complex in toluene/tetrahydrofuran (i.e. $\text{Zn}(\text{TMP})\text{--LiCl}$ or $\text{Zn}(\text{TMP})_2\text{--MgCl}_2\text{--LiCl}$). Magnesiumation of this position can also be accomplished by treatment with $\text{Mg}(\text{TMP})\text{--LiCl}$. See Verhelst, T., Ph.D. thesis, University of Antwerp, 2012 for conditions for pyridazinone metallation and for palladium catalyzed cross-coupling of 4-zincated and 4-magnesi-
 10 4-stannylpyridazinones. The synthesis and cross-coupling conditions for
 15 4-stannylpyridazinones are known from Stevenson et. al. *J. Het. Chem.* **2005**, 42, 427.

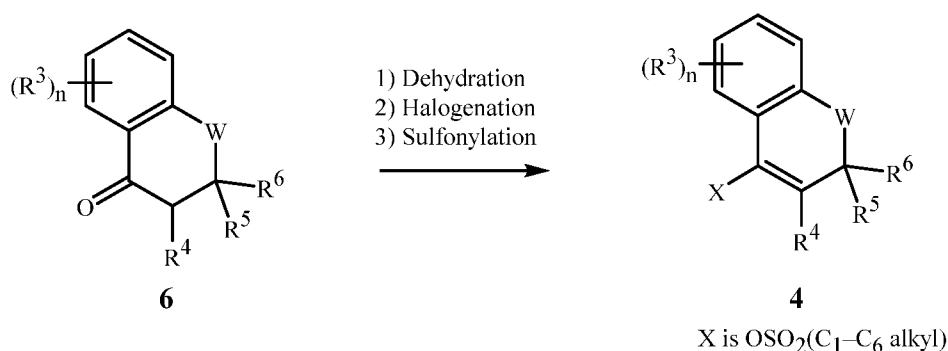
Scheme 4



Compounds of Formula **4** where X is a halide or sulfonate can be prepared from ketones of Formula **6** as shown in Scheme 5. Dehydration/halogenation can be
 20 accomplished with such reagents as phosphorous oxychloride, phosphorous oxybromide, phosphorous pentachloride, or phosphorous tribromide. These reactions can be performed neat or in a variety of solvents such as dichloromethane, dichloroethane or chlorobenzene at

temperatures ranging from 0 to 120 °C. See *Organic Letters* **2003**, 5(19), 3387–3390 where the sulfonylation can be accomplished with such reagents as methanesulfonyl chloride, trifluoromethanesulfonic anhydride, or perfluoro-1-butanefluoride. The reaction can be performed in the presence of a suitable base which includes but is not limited to, lithium diisopropylamide, lithium hexamethyldisilazide, sodium hydride, pyridine or triethylamine in an appropriate solvent such as *N,N*-dimethylformamide, tetrahydrofuran, dioxane, or dichloromethane. These reactions are performed at temperatures ranging from –78 °C to room temperature. See *J. Org. Chem.* **2015**, 80(22), 11618–11623.

Scheme 5

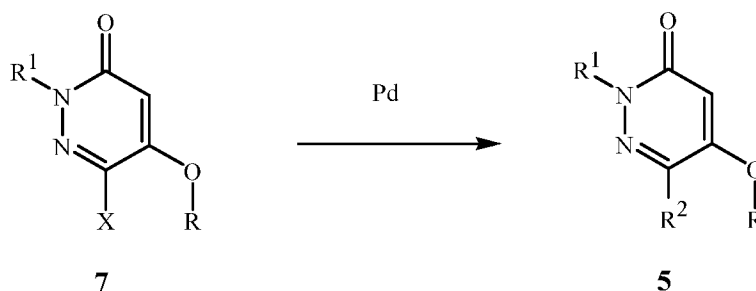


10

The R² substituent of compounds of Formula **5**, wherein R² is alkyl, cycloalkyl or substituted alkyl can be prepared by transition metal catalyzed reactions with a compound of Formula **7** as shown in Scheme 6. For reviews of these types of reactions, see: E. Negishi, *Handbook of Organopalladium Chemistry for Organic Synthesis*, John Wiley and Sons, Inc., New York, **2002**, N. Miyaura, *Cross-Coupling Reactions: A Practical Guide*, Springer, New York, **2002**, H. C. Brown et al., *Organic Synthesis via Boranes*, Aldrich Chemical Co., Milwaukee, Vol. 3, **2002**, Suzuki et al., *Chemical Reviews* **1995**, 95, 2457-2483 and Molander et al., *Accounts of Chemical Research* **2007**, 40, 275-286. Also see Tetrahedron Organic Chemistry Series Vol. 26: *Palladium in Heterocyclic Chemistry*, 2nd Ed., Gribble and Li, editors, Elsevier, Amsterdam, 2007. For a review of Buchwald-Hartwig chemistry see Yudin and Hartwig, *Catalyzed Carbon-Heteroatom Bond Formation*, 2010, Wiley, New York. Related synthetic methods for the introduction of other functional groups at the R² position of Formula **5** are known in the art. Copper catalyzed reactions are useful for introducing the CF₃ group. For a comprehensive recent review of reagents for this reaction see Wu, Neumann and Beller in *Chemistry: An Asian Journal* **2012**, ASAP, and references cited therein. For the introduction of a sulfur-containing substituent at this position, see methods disclosed in WO 2013/160126. For the introduction of a cyano group at this position, see WO 2014/031971. For the introduction of a nitro group, see *J. Am. Chem. Soc.* **2009**, 12898. For introduction of a fluoro substituent, see *J. Am. Chem. Soc.* **2014**, 3792.

38

Scheme 6



It is recognized by one skilled in the art that various functional groups can be converted into others to provide different compounds of Formula 1. For a valuable resource that illustrates the interconversion of functional groups in a simple and straightforward fashion, see Larock, R. C., *Comprehensive Organic Transformations: A Guide to Functional Group Preparations*, 2nd Ed., Wiley-VCH, New York, 1999. For example, intermediates for the preparation of compounds of Formula 1 may contain aromatic nitro groups, which can be reduced to amino groups, and then be converted via reactions well known in the art such as the Sandmeyer reaction, to various halides, providing compounds of Formula 1. The above reactions can also in many cases be performed in alternate order

It is recognized that some reagents and reaction conditions described above for preparing compounds of Formula 1 may not be compatible with certain functionalities present in the intermediates. In these instances, the incorporation of protection/deprotection sequences or functional group interconversions into the synthesis will aid in obtaining the desired products. The use and choice of the protecting groups will be apparent to one skilled in chemical synthesis (see, for example, Greene, T. W.; Wuts, P. G. M. *Protective Groups in Organic Synthesis*, 2nd ed.; Wiley: New York, 1991). One skilled in the art will recognize that, in some cases, after the introduction of a given reagent as depicted in any individual scheme, it may be necessary to perform additional routine synthetic steps not described in detail to complete the synthesis of compounds of Formula 1. One skilled in the art will also recognize that it may be necessary to perform a combination of the steps illustrated in the above schemes in an order other than that implied by the particular presented to prepare the compounds of Formula 1.

One skilled in the art will also recognize that compounds of Formula 1 and the intermediates described herein can be subjected to various electrophilic, nucleophilic, radical, organometallic, oxidation, and reduction reactions to add substituents or modify existing substituents.

Without further elaboration, it is believed that one skilled in the art using the preceding description can utilize the present invention to its fullest extent. The following non-limiting Examples are illustrative of the invention. Steps in the following Examples illustrate a

procedure for each step in an overall synthetic transformation, and the starting material for each step may not have necessarily been prepared by a particular preparative run whose procedure is described in other Examples or Steps. ¹H NMR spectra are reported in ppm downfield from tetramethylsilane in CDCl₃; “s” means singlet, “d” means doublet, and “m” means multiplet.

EXAMPLE 1

Synthesis of 4-(3,4-dihydro-2-methyl-1-naphthalenyl)-5-methoxy-2,6-dimethyl-3(2*H*)-pyridazinone (Compound 1)

Step A: Preparation of 3,4-dihydro-2-methyl-1-naphthalenyl-1,1,2,2,3,3,4,4,4-nonafluoro-1-butanesulfonate

To a solution of 2-methyl-1-tetralone (0.5 g, 3.1 mmol) in tetrahydrofuran (15 mL) at -78 °C was added lithium bis(trimethylsilyl)amide (1 M in tetrahydrofuran 3.7 mL, 3.7 mmol). The reaction mixture was stirred for 30 min. then perfluoro-1-butanesulfonyl fluoride (1.2 g, 4.0 mmol) was added, and the resulting solution was allowed to warm to ambient temperature. After 30 min. the mixture was concentrated onto Celite® diatomaceous earth filter aid and purified via silica gel chromatography using a gradient of ethyl acetate in hexanes as eluent to provide 0.97 g of the title compound.

¹H NMR δ 7.30–7.34 (m, 1H), 7.17–7.29 (m, 2H), 7.12–7.17 (m, 1H), 2.85 (m, 2H), 2.44 (m, 2H), 2.00 (s, 3H).

Step B: Preparation of 4-(3,4-dihydro-2-methyl-1-naphthalenyl)-5-methoxy-2,6-dimethyl-3(2*H*)-pyridazinone

A reaction vessel was purged with nitrogen and charged with 5-methoxy-2,6-dimethyl-3(2*H*)-pyridazinone (0.2 g, 1.3 mmol), 3,4-dihydro-2-methyl-1-naphthalenyl-1,1,2,2,3,3,4,4,4-nonafluoro-1-butanesulfonate (i.e. the compound from Step A) (0.57 g, 1.3 mmol), SPhos pre-catalyst-G2 (chloro(2-dicyclohexylphosphino-2',6'-dimethoxy-1,1'-biphenyl)[2-(2'-amino-1,1'-biphenyl)]palladium(II), (0.05 g, 0.07 mmol), and tetrahydrofuran (5 mL). Bis(2,2,6,6-tetramethylpiperidiny)zinc, lithium chloride, magnesium chloride complex (1.6 mL, 1.6 mmol) was added and the solution was heated at 50 °C overnight. The resulting mixture was concentrated onto Celite® diatomaceous earth filter aid and purified via silica gel chromatography eluting with a gradient of ethyl acetate in hexanes to provide 0.32 g of the title compound, a compound of the invention.

¹H NMR δ 7.11–7.15 (m, 1H), 7.06–7.11 (m, 2H), 6.71–6.76 (m, 1H), 3.71 (d, 6H), 2.99–3.04 (m, 1H), 2.78–2.83 (m, 1H), 2.34–2.48 (m, 2H), 2.28 (s, 3H), 1.77 (s, 3H).

EXAMPLE 2

Synthesis of 4-(3,4-dihydro-2-methyl-1-naphthalenyl)-5-hydroxy-2,6-dimethyl-3(2*H*)-pyridazinone (Compound 2)

Step A: Preparation of 4-(3,4-dihydro-2-methyl-1-naphthalenyl)-5-hydroxy-2,6-dimethyl-3(2*H*)-pyridazinone

A solution of the 4-(3,4-dihydro-2-methyl-1-naphthalenyl)-5-methoxy-2,6-dimethyl-3(2*H*)-pyridazinone (i.e. the product from Step B above) (0.2 g, 0.68 mmol) and morpholine (2 mL) were heated at 120 °C for 40 min. The resulting solution was cooled to ambient temperature and 1 N aqueous hydrochloric acid (50 mL) and isopropanol (0.5 mL) were added. The resulting mixture was stirred for 10 min and the resulting solid that formed was filtered and washed with water. The solid was dried under vacuum to give 0.16 g of the title compound, a compound of the invention.

¹H NMR δ 7.03–7.17 (m, 3H), 6.66–6.75 (m, 1H), 5.50 (s, 1H), 3.75 (s, 3H), 2.94–3.05 (m, 1H), 2.79–2.90 (m, 1H), 2.39–2.56 (m, 2H), 2.33 (s, 3H), 1.80 (s, 3H).

EXAMPLE 3

Synthesis of 5-hydroxy-2,6-dimethyl-4-(3-methyl-2*H*-1-benzopyran-4-yl)-3(2*H*)-pyridazinone (Compound 3)

Step A: Preparation of 3-methyl-2*H*-1-benzopyran-4-yl 1,1,2,2,3,3,4,4,4-nonafluoro-1-butanesulfonate

To a solution of 3-methyl-4-chromanone (1.0 g, 6.2 mmol) in tetrahydrofuran (12 mL) at –78 °C was added lithium bis(trimethylsilyl)amide (1 M in tetrahydrofuran, 3.7 mL, 3.7 mmol). The reaction was stirred for 10 min then perfluoro-1-butanesulfonyl fluoride (2.6 g, 8.7 mmol) was added, and the resulting mixture was allowed to warm to ambient temperature. After 30 min the mixture was concentrated onto Celite® diatomaceous earth filter aid, and purified via silica gel chromatography with ethyl acetate in hexanes as eluent to provide 1.2 g of the title compound.

¹H NMR δ 7.16–7.24 (m, 2H), 6.93–7.00 (m, 1H), 6.81–6.86 (m, 1H), 4.81 (s, 2H), 1.86–1.92 (m, 3H).

Step B: Preparation of 5-methoxy-2,6-dimethyl-4-(3-methyl-2*H*-1-benzopyran-4-yl)-3(2*H*)-pyridazinone

A reaction vessel was purged with nitrogen and charged with 5-methoxy-2,6-dimethyl-3(2*H*)-pyridazinone (0.2 g, 1.3 mmol), 3-methyl-2*H*-1-benzopyran-4-yl 1,1,2,2,3,3,4,4,4-nonafluoro-1-butanesulfonate (i.e. the product from Step A) (0.58 g, 1.3 mmol), SPhos pre-catalyst-G2 (chloro(2-dicyclohexylphosphino-2',6'-dimethoxy-1,1'-biphenyl)[2-(2'-amino-1,1'-biphenyl)]palladium(II), 0.05 g, 0.07 mmol), and tetrahydrofuran (5 mL). Bis(2,2,6,6-tetramethylpiperidinyl)zinc, lithium chloride, magnesium chloride complex (1.6 mL, 1.6 mmol) was added and the solution was heated at 50 °C overnight. The resulting mixture was concentrated onto Celite® diatomaceous earth filter aid and purified via silica gel chromatography eluting with ethyl acetate in hexanes to provide 0.40 g of the title compound.

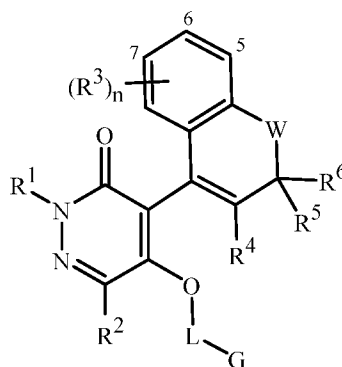
^1H NMR δ 7.04–7.11 (m, 1H), 6.80–6.86 (m, 2H), 6.67–6.72 (m, 1H), 4.87 (d, 1H), 4.71 (d, 1H), 3.71–3.78 (m, 6H), 2.28 (s, 3H), 1.67 (s, 3H).

Step C: Preparation of 5-hydroxy-2,6-dimethyl-4-(3-methyl-2*H*-1-benzopyran-4-yl)-3(2*H*)-pyridazinone

5 A solution of 5-methoxy-2,6-dimethyl-4-(3-methyl-2*H*-1-benzopyran-4-yl)-3(2*H*)-pyridazinone (i.e. the product from Step B) (0.25 g, 0.88 mmol) and morpholine (2 mL) were heated at 120 °C for 30 min. The solution was concentrated to dryness *in vacuo* and 1 N aqueous hydrochloric acid (50 mL) and isopropanol (0.5 mL) were added. The resulting mixture was stirred for 10 min and the solid was filtered and washed with water. The solid
10 was dried under vacuum to give 0.20 g of the title compound, a compound of the invention.
 ^1H NMR δ 7.03–7.11 (m, 1H), 6.76–6.83 (m, 2H), 6.63–6.68 (m, 1H), 4.82 (d, 1H), 4.64 (d, 1H), 3.70 (s, 3H), 2.31 (s, 3H), 1.60 (s, 3H).

By the procedures described herein together with methods known in the art, the following compounds of Tables 1 to 959 can be prepared. The following abbreviations are
15 used in the Tables which follow: Me means methyl, Et means ethyl, Pr means propyl, *i*-Pr means isopropyl, *t*-Bu means tertiarybutyl, OMe means methoxy, OEt means ethoxy, SMe means methylthio, SEt means ethylthio, -CN means cyano, and SO₂Me means methylsulfonyl. A “–” in the (R³)_n column means n = 0.

TABLE 1



20

W is –CH₂–, R¹ is Me, R² is Me, R⁵ is H, R⁶ is H, L-G is H and

(R ³) _n	R ⁴	(R ³) _n	R ⁴	(R ³) _n	R ⁴
–	H	5-Pr	H	6-CN	H
5-Me	H	6-Pr	H	7-CN	H
6-Me	H	7-Pr	H	5-CF ₃	H
7-Me	H	5-OMe	H	6-CF ₃	H
5-Et	H	6-OMe	H	7-CF ₃	H
6-Et	H	7-OMe	H	5-F	H
7-Et	H	5-CN	H	6-F	H

$(R^3)_n$	R^4	$(R^3)_n$	R^4	$(R^3)_n$	R^4
7-F	H	7-CN	Pr	7-Pr	Br
5-Cl	H	5-CF ₃	Pr	5-OMe	Br
6-Cl	H	6-CF ₃	Pr	6-OMe	Br
7-Cl	H	7-CF ₃	Pr	7-OMe	Br
5-Br	H	5-F	Pr	5-CN	Br
6-Br	H	6-F	Pr	6-CN	Br
7-Br	H	7-F	Pr	7-CN	Br
5-OCHF ₂	H	5-Cl	Pr	5-CF ₃	Br
6-OCHF ₂	H	6-Cl	Pr	6-CF ₃	Br
7-OCHF ₂	H	7-Cl	Pr	7-CF ₃	Br
6,7-di-Me	H	5-Br	Pr	5-F	Br
5,7-di-Me	H	6-Br	Pr	6-F	Br
5-Cl, 7-Me	H	7-Br	Pr	7-F	Br
5-Cl, 7-OMe	H	5-OCHF ₂	Pr	5-Cl	Br
5-F, 7-Me	H	6-OCHF ₂	Pr	6-Cl	Br
5-Me, 7-F	H	7-OCHF ₂	Pr	7-Cl	Br
5-Me, 7-Cl	H	6,7-di-Me	Pr	5-Br	Br
5-Me, 7-CN	H	5,7-di-Me	Pr	6-Br	Br
5-Me, 7-OMe	H	5-Cl, 7-Me	Pr	7-Br	Br
5,7-di-F	H	5-Cl, 7-OMe	Pr	5-OCHF ₂	Br
5,7-di-Cl	H	5-F, 7-Me	Pr	6-OCHF ₂	Br
5,7-di-Br	H	5-Me, 7-F	Pr	7-OCHF ₂	Br
—	Pr	5-Me, 7-Cl	Pr	6,7-di-Me	Br
5-Me	Pr	5-Me, 7-CN	Pr	5,7-di-Me	Br
6-Me	Pr	5-Me, 7-OMe	Pr	5-Cl, 7-Me	Br
7-Me	Pr	5,7-di-F	Pr	5-Cl, 7-OMe	Br
5-Et	Pr	5,7-di-Cl	Pr	5-F, 7-Me	Br
6-Et	Pr	5,7-di-Br	Pr	5-Me, 7-F	Br
7-Et	Pr	—	Br	5-Me, 7-Cl	Br
5-Pr	Pr	5-Me	Br	5-Me, 7-CN	Br
6-Pr	Pr	6-Me	Br	5-Me, 7-OMe	Br
7-Pr	Pr	7-Me	Br	5,7-di-F	Br
5-OMe	Pr	5-Et	Br	5,7-di-Cl	Br
6-OMe	Pr	6-Et	Br	5,7-di-Br	Br
7-OMe	Pr	7-Et	Br	—	OMe
5-CN	Pr	5-Pr	Br	5-Me	OMe
6-CN	Pr	6-Pr	Br	6-Me	OMe

$(R^3)_n$	R^4	$(R^3)_n$	R^4	$(R^3)_n$	R^4
7-Me	OMe	5,7-di-F	OMe	5-Cl, 7-OMe	SCHF ₂
5-Et	OMe	5,7-di-Cl	OMe	5-F, 7-Me	SCHF ₂
6-Et	OMe	5,7-di-Br	OMe	5-Me, 7-F	SCHF ₂
7-Et	OMe	–	SCHF ₂	5-Me, 7-Cl	SCHF ₂
5-Pr	OMe	5-Me	SCHF ₂	5-Me, 7-CN	SCHF ₂
6-Pr	OMe	6-Me	SCHF ₂	5-Me, 7-OMe	SCHF ₂
7-Pr	OMe	7-Me	SCHF ₂	5,7-di-F	SCHF ₂
5-OMe	OMe	5-Et	SCHF ₂	5,7-di-Cl	SCHF ₂
6-OMe	OMe	6-Et	SCHF ₂	5,7-di-Br	SCHF ₂
7-OMe	OMe	7-Et	SCHF ₂	–	Me
5-CN	OMe	5-Pr	SCHF ₂	5-Me	Me
6-CN	OMe	6-Pr	SCHF ₂	6-Me	Me
7-CN	OMe	7-Pr	SCHF ₂	7-Me	Me
5-CF ₃	OMe	5-OMe	SCHF ₂	5-Et	Me
6-CF ₃	OMe	6-OMe	SCHF ₂	6-Et	Me
7-CF ₃	OMe	7-OMe	SCHF ₂	7-Et	Me
5-F	OMe	5-CN	SCHF ₂	5-Pr	Me
6-F	OMe	6-CN	SCHF ₂	6-Pr	Me
7-F	OMe	7-CN	SCHF ₂	7-Pr	Me
5-Cl	OMe	5-CF ₃	SCHF ₂	5-OMe	Me
6-Cl	OMe	6-CF ₃	SCHF ₂	6-OMe	Me
7-Cl	OMe	7-CF ₃	SCHF ₂	7-OMe	Me
5-Br	OMe	5-F	SCHF ₂	5-CN	Me
6-Br	OMe	6-F	SCHF ₂	6-CN	Me
7-Br	OMe	7-F	SCHF ₂	7-CN	Me
5-OCHF ₂	OMe	5-Cl	SCHF ₂	5-CF ₃	Me
6-OCHF ₂	OMe	6-Cl	SCHF ₂	6-CF ₃	Me
7-OCHF ₂	OMe	7-Cl	SCHF ₂	7-CF ₃	Me
6,7-di-Me	OMe	5-Br	SCHF ₂	5-F	Me
5,7-di-Me	OMe	6-Br	SCHF ₂	6-F	Me
5-Cl, 7-Me	OMe	7-Br	SCHF ₂	7-F	Me
5-Cl, 7-OMe	OMe	5-OCHF ₂	SCHF ₂	5-Cl	Me
5-F, 7-Me	OMe	6-OCHF ₂	SCHF ₂	6-Cl	Me
5-Me, 7-F	OMe	7-OCHF ₂	SCHF ₂	7-Cl	Me
5-Me, 7-Cl	OMe	6,7-di-Me	SCHF ₂	5-Br	Me
5-Me, 7-CN	OMe	5,7-di-Me	SCHF ₂	6-Br	Me
5-Me, 7-OMe	OMe	5-Cl, 7-Me	SCHF ₂	7-Br	Me

$(R^3)_n$	R^4	$(R^3)_n$	R^4	$(R^3)_n$	R^4
5-OCHF ₂	Me	5-Cl	F	5-CF ₃	CN
6-OCHF ₂	Me	6-Cl	F	6-CF ₃	CN
7-OCHF ₂	Me	7-Cl	F	7-CF ₃	CN
6,7-di-Me	Me	5-Br	F	5-F	CN
5,7-di-Me	Me	6-Br	F	6-F	CN
5-Cl, 7-Me	Me	7-Br	F	7-F	CN
5-Cl, 7-OMe	Me	5-OCHF ₂	F	5-Cl	CN
5-F, 7-Me	Me	6-OCHF ₂	F	6-Cl	CN
5-Me, 7-F	Me	7-OCHF ₂	F	7-Cl	CN
5-Me, 7-Cl	Me	6,7-di-Me	F	5-Br	CN
5-Me, 7-CN	Me	5,7-di-Me	F	6-Br	CN
5-Me, 7-OMe	Me	5-Cl, 7-Me	F	7-Br	CN
5,7-di-F	Me	5-Cl, 7-OMe	F	5-OCHF ₂	CN
5,7-di-Cl	Me	5-F, 7-Me	F	6-OCHF ₂	CN
5,7-di-Br	Me	5-Me, 7-F	F	7-OCHF ₂	CN
—	F	5-Me, 7-Cl	F	6,7-di-Me	CN
5-Me	F	5-Me, 7-CN	F	5,7-di-Me	CN
6-Me	F	5-Me, 7-OMe	F	5-Cl, 7-Me	CN
7-Me	F	5,7-di-F	F	5-Cl, 7-OMe	CN
5-Et	F	5,7-di-Cl	F	5-F, 7-Me	CN
6-Et	F	5,7-di-Br	F	5-Me, 7-F	CN
7-Et	F	—	CN	5-Me, 7-Cl	CN
5-Pr	F	5-Me	CN	5-Me, 7-CN	CN
6-Pr	F	6-Me	CN	5-Me, 7-OMe	CN
7-Pr	F	7-Me	CN	5,7-di-F	CN
5-OMe	F	5-Et	CN	5,7-di-Cl	CN
6-OMe	F	6-Et	CN	5,7-di-Br	CN
7-OMe	F	7-Et	CN	—	OCHF ₂
5-CN	F	5-Pr	CN	5-Me	OCHF ₂
6-CN	F	6-Pr	CN	6-Me	OCHF ₂
7-CN	F	7-Pr	CN	7-Me	OCHF ₂
5-CF ₃	F	5-OMe	CN	5-Et	OCHF ₂
6-CF ₃	F	6-OMe	CN	6-Et	OCHF ₂
7-CF ₃	F	7-OMe	CN	7-Et	OCHF ₂
5-F	F	5-CN	CN	5-Pr	OCHF ₂
6-F	F	6-CN	CN	6-Pr	OCHF ₂
7-F	F	7-CN	CN	7-Pr	OCHF ₂

$(R^3)_n$	R^4	$(R^3)_n$	R^4	$(R^3)_n$	R^4
5-OMe	OCHF ₂	5-Et	SCF ₃	5,7-di-Cl	SCF ₃
6-OMe	OCHF ₂	6-Et	SCF ₃	5,7-di-Br	SCF ₃
7-OMe	OCHF ₂	7-Et	SCF ₃	—	Et
5-CN	OCHF ₂	5-Pr	SCF ₃	5-Me	Et
6-CN	OCHF ₂	6-Pr	SCF ₃	6-Me	Et
7-CN	OCHF ₂	7-Pr	SCF ₃	7-Me	Et
5-CF ₃	OCHF ₂	5-OMe	SCF ₃	5-Et	Et
6-CF ₃	OCHF ₂	6-OMe	SCF ₃	6-Et	Et
7-CF ₃	OCHF ₂	7-OMe	SCF ₃	7-Et	Et
5-F	OCHF ₂	5-CN	SCF ₃	5-Pr	Et
6-F	OCHF ₂	6-CN	SCF ₃	6-Pr	Et
7-F	OCHF ₂	7-CN	SCF ₃	7-Pr	Et
5-Cl	OCHF ₂	5-CF ₃	SCF ₃	5-OMe	Et
6-Cl	OCHF ₂	6-CF ₃	SCF ₃	6-OMe	Et
7-Cl	OCHF ₂	7-CF ₃	SCF ₃	7-OMe	Et
5-Br	OCHF ₂	5-F	SCF ₃	5-CN	Et
6-Br	OCHF ₂	6-F	SCF ₃	6-CN	Et
7-Br	OCHF ₂	7-F	SCF ₃	7-CN	Et
5-OCHF ₂	OCHF ₂	5-Cl	SCF ₃	5-CF ₃	Et
6-OCHF ₂	OCHF ₂	6-Cl	SCF ₃	6-CF ₃	Et
7-OCHF ₂	OCHF ₂	7-Cl	SCF ₃	7-CF ₃	Et
6,7-di-Me	OCHF ₂	5-Br	SCF ₃	5-F	Et
5,7-di-Me	OCHF ₂	6-Br	SCF ₃	6-F	Et
5-Cl, 7-Me	OCHF ₂	7-Br	SCF ₃	7-F	Et
5-Cl, 7-OMe	OCHF ₂	5-OOCHF ₂	SCF ₃	5-Cl	Et
5-F, 7-Me	OCHF ₂	6-OCHF ₂	SCF ₃	6-Cl	Et
5-Me, 7-F	OCHF ₂	7-OCHF ₂	SCF ₃	7-Cl	Et
5-Me, 7-Cl	OCHF ₂	6,7-di-Me	SCF ₃	5-Br	Et
5-Me, 7-CN	OCHF ₂	5,7-di-Me	SCF ₃	6-Br	Et
5-Me, 7-OMe	OCHF ₂	5-Cl, 7-Me	SCF ₃	7-Br	Et
5,7-di-F	OCHF ₂	5-Cl, 7-OMe	SCF ₃	5-OCHF ₂	Et
5,7-di-Cl	OCHF ₂	5-F, 7-Me	SCF ₃	6-OCHF ₂	Et
5,7-di-Br	OCHF ₂	5-Me, 7-F	SCF ₃	7-OCHF ₂	Et
—	SCF ₃	5-Me, 7-Cl	SCF ₃	6,7-di-Me	Et
5-Me	SCF ₃	5-Me, 7-CN	SCF ₃	5,7-di-Me	Et
6-Me	SCF ₃	5-Me, 7-OMe	SCF ₃	5-Cl, 7-Me	Et
7-Me	SCF ₃	5,7-di-F	SCF ₃	5-Cl, 7-OMe	Et

$(R^3)_n$	R^4	$(R^3)_n$	R^4	$(R^3)_n$	R^4
5-F, 7-Me	Et	6-OCHF ₂	Cl	6-Cl	C≡CH
5-Me, 7-F	Et	7-OCHF ₂	Cl	7-Cl	C≡CH
5-Me, 7-Cl	Et	6,7-di-Me	Cl	5-Br	C≡CH
5-Me, 7-CN	Et	5,7-di-Me	Cl	6-Br	C≡CH
5-Me, 7-OMe	Et	5-Cl, 7-Me	Cl	7-Br	C≡CH
5,7-di-F	Et	5-Cl, 7-OMe	Cl	5-OCHF ₂	C≡CH
5,7-di-Cl	Et	5-F, 7-Me	Cl	6-OCHF ₂	C≡CH
5,7-di-Br	Et	5-Me, 7-F	Cl	7-OCHF ₂	C≡CH
—	Cl	5-Me, 7-Cl	Cl	6,7-di-Me	C≡CH
5-Me	Cl	5-Me, 7-CN	Cl	5,7-di-Me	C≡CH
6-Me	Cl	5-Me, 7-OMe	Cl	5-Cl, 7-Me	C≡CH
7-Me	Cl	5,7-di-F	Cl	5-Cl, 7-OMe	C≡CH
5-Et	Cl	5,7-di-Cl	Cl	5-F, 7-Me	C≡CH
6-Et	Cl	5,7-di-Br	Cl	5-Me, 7-F	C≡CH
7-Et	Cl	—	C≡CH	5-Me, 7-Cl	C≡CH
5-Pr	Cl	5-Me	C≡CH	5-Me, 7-CN	C≡CH
6-Pr	Cl	6-Me	C≡CH	5-Me, 7-OMe	C≡CH
7-Pr	Cl	7-Me	C≡CH	5,7-di-F	C≡CH
5-OMe	Cl	5-Et	C≡CH	5,7-di-Cl	C≡CH
6-OMe	Cl	6-Et	C≡CH	5,7-di-Br	C≡CH
7-OMe	Cl	7-Et	C≡CH	—	SMe
5-CN	Cl	5-Pr	C≡CH	5-Me	SMe
6-CN	Cl	6-Pr	C≡CH	6-Me	SMe
7-CN	Cl	7-Pr	C≡CH	7-Me	SMe
5-CF ₃	Cl	5-OMe	C≡CH	5-Et	SMe
6-CF ₃	Cl	6-OMe	C≡CH	6-Et	SMe
7-CF ₃	Cl	7-OMe	C≡CH	7-Et	SMe
5-F	Cl	5-CN	C≡CH	5-Pr	SMe
6-F	Cl	6-CN	C≡CH	6-Pr	SMe
7-F	Cl	7-CN	C≡CH	7-Pr	SMe
5-Cl	Cl	5-CF ₃	C≡CH	5-OMe	SMe
6-Cl	Cl	6-CF ₃	C≡CH	6-OMe	SMe
7-Cl	Cl	7-CF ₃	C≡CH	7-OMe	SMe
5-Br	Cl	5-F	C≡CH	5-CN	SMe
6-Br	Cl	6-F	C≡CH	6-CN	SMe
7-Br	Cl	7-F	C≡CH	7-CN	SMe
5OCHF ₂	Cl	5-Cl	C≡CH	5-CF ₃	SMe

$(R^3)_n$	R^4	$(R^3)_n$	R^4	$(R^3)_n$	R^4
6-CF ₃	SMe	6-Br	SMe	5-F, 7-Me	SMe
7-CF ₃	SMe	7-Br	SMe	5-Me, 7-F	SMe
5-F	SMe	5-OCHF ₂	SMe	5-Me, 7-Cl	SMe
6-F	SMe	6-OCHF ₂	SMe	5-Me, 7-CN	SMe
7-F	SMe	7-OCHF ₂	SMe	5-Me, 7-OMe	SMe
5-Cl	SMe	6,7-di-Me	SMe	5,7-di-F	SMe
6-Cl	SMe	5,7-di-Me	SMe	5,7-di-Cl	SMe
7-Cl	SMe	5-Cl, 7-Me	SMe	5,7-di-Br	SMe
5-Br	SMe	5-Cl, 7-OMe	SMe		

Table 2 is constructed in the same manner as Table 1 except that the Row Heading “W is $-\text{CH}_2-$, R^1 is Me, R^2 is Me, R^5 is H, R^6 is H, L-G is H and” is replaced with the Row Heading listed for Table 2 below (i.e. “W is $-\text{CH}_2-$, R^1 is Me, R^2 is Me, R^5 is H, R^6 is H, and L-G is C(O)Et.”). Therefore the first entry in Table 2 is a compound of Formula 1 wherein W is $-\text{CH}_2-$, R^1 is Me, R^2 is Me, $(R^3)_n$ is “-” (i.e. n is 0; no substitution with R^3), R^5 is H, R^6 is H, and L-G is C(O)Et. Tables 3 through 959 are constructed similarly.

Table	Row Heading
2	W is $-\text{CH}_2-$, R^1 is Me, R^2 is Me, R^5 is H, R^6 is H, L-G is C(O)Et, and
3	W is $-\text{CH}_2-$, R^1 is Me, R^2 is Me, R^5 is H, R^6 is H, L-G is C(O)-i-Pr, and
4	W is $-\text{CH}_2-$, R^1 is Me, R^2 is Me, R^5 is H, R^6 is H, L-G is C(O)-t-Bu, and
5	W is $-\text{CH}_2-$, R^1 is Me, R^2 is Me, R^5 is H, R^6 is H, L-G is CO ₂ Me, and
6	W is $-\text{CH}_2-$, R^1 is Me, R^2 is Me, R^5 is H, R^6 is H, L-G is CO ₂ Et, and
7	W is $-\text{CH}_2-$, R^1 is Me, R^2 is Me, R^5 is H, R^6 is H, L-G is CO ₂ -i-Pr, and
8	W is $-\text{CH}_2-$, R^1 is Me, R^2 is Me, R^5 is H, R^6 is H, L-G is CO ₂ -t-Bu, and
9	W is $-\text{CH}_2-$, R^1 is Me, R^2 is Me, R^5 is H, R^6 is H, L-G is SO ₂ Me, and
10	W is $-\text{CH}_2-$, R^1 is Me, R^2 is H, R^5 is H, R^6 is H, L-G is H, and
11	W is $-\text{CH}_2-$, R^1 is Me, R^2 is H, R^5 is H, R^6 is H, L-G is C(O)Me, and
12	W is $-\text{CH}_2-$, R^1 is Me, R^2 is H, R^5 is H, R^6 is H, L-G is C(O)Et, and
13	W is $-\text{CH}_2-$, R^1 is Me, R^2 is H, R^5 is H, R^6 is H, L-G is C(O)-i-Pr, and
14	W is $-\text{CH}_2-$, R^1 is Me, R^2 is H, R^5 is H, R^6 is H, L-G is C(O)-t-Bu, and
15	W is $-\text{CH}_2-$, R^1 is Me, R^2 is H, R^5 is H, R^6 is H, L-G is CO ₂ Me, and
16	W is $-\text{CH}_2-$, R^1 is Me, R^2 is H, R^5 is H, R^6 is H, L-G is CO ₂ Et, and
17	W is $-\text{CH}_2-$, R^1 is Me, R^2 is H, R^5 is H, R^6 is H, L-G is CO ₂ -i-Pr, and
18	W is $-\text{CH}_2-$, R^1 is Me, R^2 is H, R^5 is H, R^6 is H, L-G is CO ₂ -t-Bu, and
19	W is $-\text{CH}_2-$, R^1 is Me, R^2 is H, R^5 is H, R^6 is H, L-G is SO ₂ Me, and
20	W is $-\text{CH}_2-$, R^1 is Me, R^2 is CF ₃ , R^5 is H, R^6 is H, L-G is H, and
21	W is $-\text{CH}_2-$, R^1 is Me, R^2 is CF ₃ , R^5 is H, R^6 is H, L-G is C(O)Me, and

22	W is -CH ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
23	W is -CH ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is C(O)-i-Pr, and
24	W is -CH ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is C(O)-t-Bu, and
25	W is -CH ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
26	W is -CH ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
27	W is -CH ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is CO ₂ -i-Pr, and
28	W is -CH ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is CO ₂ -t-Bu, and
29	W is -CH ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
30	W is -CH ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is H, and
31	W is -CH ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
32	W is -CH ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
33	W is -CH ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is C(O)-i-Pr, and
34	W is -CH ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is C(O)-t-Bu, and
35	W is -CH ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
36	W is -CH ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
37	W is -CH ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is CO ₂ -i-Pr, and
38	W is -CH ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is CO ₂ -t-Bu, and
39	W is -CH ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
40	W is -CH ₂ -, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is H, and
41	W is -CH ₂ -, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
42	W is -CH ₂ -, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
43	W is -CH ₂ -, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is C(O)-i-Pr, and
44	W is -CH ₂ -, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is C(O)-t-Bu, and
45	W is -CH ₂ -, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
46	W is -CH ₂ -, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
47	W is -CH ₂ -, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is CO ₂ -i-Pr, and
48	W is -CH ₂ -, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is CO ₂ -t-Bu, and
49	W is -CH ₂ -, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
50	W is -CH ₂ -, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is H, and
51	W is -CH ₂ -, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
52	W is -CH ₂ -, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
53	W is -CH ₂ -, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is C(O)-i-Pr, and
54	W is -CH ₂ -, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is C(O)-t-Bu, and
55	W is -CH ₂ -, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
56	W is -CH ₂ -, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
57	W is -CH ₂ -, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is CO ₂ -i-Pr, and
58	W is -CH ₂ -, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is CO ₂ -t-Bu, and

59	W is -CH ₂ -, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
60	W is -CH ₂ -, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is H, and
61	W is -CH ₂ -, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
62	W is -CH ₂ -, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
63	W is -CH ₂ -, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
64	W is -CH ₂ -, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
65	W is -CH ₂ -, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
66	W is -CH ₂ -, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
67	W is -CH ₂ -, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
68	W is -CH ₂ -, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
69	W is -CH ₂ -, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
70	W is -CH ₂ -, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is H, and
71	W is -CH ₂ -, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
72	W is -CH ₂ -, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
73	W is -CH ₂ -, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
74	W is -CH ₂ -, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
75	W is -CH ₂ -, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
76	W is -CH ₂ -, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
77	W is -CH ₂ -, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
78	W is -CH ₂ -, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
79	W is -CH ₂ -, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
80	W is -CH ₂ -, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is H, and
81	W is -CH ₂ -, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
82	W is -CH ₂ -, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
83	W is -CH ₂ -, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
84	W is -CH ₂ -, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
85	W is -CH ₂ -, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
86	W is -CH ₂ -, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
87	W is -CH ₂ -, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
88	W is -CH ₂ -, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
89	W is -CH ₂ -, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
90	W is -CH ₂ -, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is H, and
91	W is -CH ₂ -, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
92	W is -CH ₂ -, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
93	W is -CH ₂ -, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
94	W is -CH ₂ -, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
95	W is -CH ₂ -, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and

96	W is -CH ₂ -, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
97	W is -CH ₂ -, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is CO ₂ -i-Pr, and
98	W is -CH ₂ -, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is CO ₂ -t-Bu, and
99	W is -CH ₂ -, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
100	W is -CH ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is H, and
101	W is -CH ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
102	W is -CH ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
103	W is -CH ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is C(O)-i-Pr, and
104	W is -CH ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is C(O)-t-Bu, and
105	W is -CH ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
106	W is -CH ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
107	W is -CH ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is CO ₂ -i-Pr, and
108	W is -CH ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is CO ₂ -t-Bu, and
109	W is -CH ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
110	W is -CH ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is H, and
111	W is -CH ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
112	W is -CH ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
113	W is -CH ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is C(O)-i-Pr, and
114	W is -CH ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is C(O)-t-Bu, and
115	W is -CH ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
116	W is -CH ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
117	W is -CH ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is CO ₂ -i-Pr, and
118	W is -CH ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is CO ₂ -t-Bu, and
119	W is -CH ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
120	W is -CH ₂ -, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is H, and
121	W is -CH ₂ -, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
122	W is -CH ₂ -, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
123	W is -CH ₂ -, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is C(O)-i-Pr, and
124	W is -CH ₂ -, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is C(O)-t-Bu, and
125	W is -CH ₂ -, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
126	W is -CH ₂ -, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
127	W is -CH ₂ -, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is CO ₂ -i-Pr, and
128	W is -CH ₂ -, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is CO ₂ -t-Bu, and
129	W is -CH ₂ -, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
130	W is -CH ₂ -, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is H, and
131	W is -CH ₂ -, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
132	W is -CH ₂ -, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and

133	W is -CH ₂ -, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
134	W is -CH ₂ -, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
135	W is -CH ₂ -, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
136	W is -CH ₂ -, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
137	W is -CH ₂ -, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
138	W is -CH ₂ -, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
139	W is -CH ₂ -, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
140	W is -CH ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is H, and
141	W is -CH ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
142	W is -CH ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
143	W is -CH ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
144	W is -CH ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
145	W is -CH ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
146	W is -CH ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
147	W is -CH ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
148	W is -CH ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
149	W is -CH ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
150	W is -CH ₂ -, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is H, and
151	W is -CH ₂ -, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
152	W is -CH ₂ -, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
153	W is -CH ₂ -, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
154	W is -CH ₂ -, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
155	W is -CH ₂ -, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
156	W is -CH ₂ -, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
157	W is -CH ₂ -, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
158	W is -CH ₂ -, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
159	W is -CH ₂ -, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
160	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is H, and
161	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
162	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
163	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
164	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
165	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
166	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
167	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
168	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
169	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and

170	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is H, R ⁵ is H, R ⁶ is H, L-G is H, and
171	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is H, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
172	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is H, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
173	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is H, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
174	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is H, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
175	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is H, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
176	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is H, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
177	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is H, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
178	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is H, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
179	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is H, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
180	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is H, and
181	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
182	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
183	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
184	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
185	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
186	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
187	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
188	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
189	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
190	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is H, and
191	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
192	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
193	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
194	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
195	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
196	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
197	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
198	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
199	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
200	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is H, and
201	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
202	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
203	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
204	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
205	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
206	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and

207	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
208	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
209	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
210	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is H, and
211	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
212	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
213	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
214	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
215	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
216	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
217	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
218	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
219	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
220	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is H, and
221	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
222	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
223	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
224	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
225	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
226	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
227	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
228	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
229	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
230	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is H, and
231	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
232	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
233	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
234	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
235	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
236	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
237	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
238	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
239	W is -C(CH ₃) ₂ -, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
240	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is H, and
241	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
242	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
243	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and

244	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
245	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
246	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
247	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
248	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
249	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
250	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is H, and
251	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
252	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
253	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
254	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
255	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
256	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
257	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
258	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
259	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
260	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is H, and
261	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
262	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
263	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
264	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
265	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
266	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
267	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
268	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
269	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
270	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is H, and
271	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
272	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
273	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
274	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
275	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
276	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
277	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
278	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
279	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
280	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is H, and

281	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
282	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
283	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
284	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
285	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
286	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
287	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
288	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
289	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
290	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is H, and
291	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
292	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
293	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
294	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
295	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
296	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
297	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
298	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
299	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
300	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is H, and
301	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
302	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
303	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
304	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
305	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
306	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
307	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
308	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
309	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
310	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is H, and
311	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
312	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
313	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
314	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
315	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
316	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
317	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and

318	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
319	W is -C(CH ₃) ₂ -, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
320	W is -O-, R ¹ is Me, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is H, and
321	W is -O-, R ¹ is Me, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
322	W is -O-, R ¹ is Me, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
323	W is -O-, R ¹ is Me, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
324	W is -O-, R ¹ is Me, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
325	W is -O-, R ¹ is Me, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
326	W is -O-, R ¹ is Me, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
327	W is -O-, R ¹ is Me, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
328	W is -O-, R ¹ is Me, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
329	W is -O-, R ¹ is Me, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
330	W is -O-, R ¹ is Me, R ² is H, R ⁵ is H, R ⁶ is H, L-G is H, and
331	W is -O-, R ¹ is Me, R ² is H, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
332	W is -O-, R ¹ is Me, R ² is H, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
333	W is -O-, R ¹ is Me, R ² is H, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
334	W is -O-, R ¹ is Me, R ² is H, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
335	W is -O-, R ¹ is Me, R ² is H, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
336	W is -O-, R ¹ is Me, R ² is H, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
337	W is -O-, R ¹ is Me, R ² is H, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
338	W is -O-, R ¹ is Me, R ² is H, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
339	W is -O-, R ¹ is Me, R ² is H, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
340	W is -O-, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is H
341	W is -O-, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
342	W is -O-, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
343	W is -O-, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
344	W is -O-, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
345	W is -O-, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
346	W is -O-, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
347	W is -O-, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
348	W is -O-, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
349	W is -O-, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
350	W is -O-, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is H, and
351	W is -O-, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
352	W is -O-, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
353	W is -O-, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
354	W is -O-, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and

355	W is -O-, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
356	W is -O-, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
357	W is -O-, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is CO ₂ -i-Pr, and
358	W is -O-, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is CO ₂ -t-Bu, and
359	W is -O-, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
360	W is -O-, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is H, and
361	W is -O-, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
362	W is -O-, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
363	W is -O-, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is C(O)-i-Pr, and
364	W is -O-, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is C(O)-t-Bu, and
365	W is -O-, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
366	W is -O-, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
367	W is -O-, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is CO ₂ -i-Pr, and
368	W is -O-, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is CO ₂ -t-Bu, and
369	W is -O-, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
370	W is -O-, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is H, and
371	W is -O-, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
372	W is -O-, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
373	W is -O-, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is C(O)-i-Pr, and
374	W is -O-, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is C(O)-t-Bu, and
375	W is -O-, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
376	W is -O-, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
377	W is -O-, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is CO ₂ -i-Pr, and
378	W is -O-, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is CO ₂ -t-Bu, and
379	W is -O-, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
380	W is -O-, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is H, and
381	W is -O-, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
382	W is -O-, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
383	W is -O-, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is C(O)-i-Pr, and
384	W is -O-, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is C(O)-t-Bu, and
385	W is -O-, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
386	W is -O-, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
387	W is -O-, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is CO ₂ -i-Pr, and
388	W is -O-, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is CO ₂ -t-Bu, and
389	W is -O-, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
390	W is -O-, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is H, and
391	W is -O-, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and

392	W is -O-, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
393	W is -O-, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
394	W is -O-, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
395	W is -O-, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
396	W is -O-, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
397	W is -O-, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
398	W is -O-, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
399	W is -O-, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
400	W is -O-, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is H, and
401	W is -O-, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
402	W is -O-, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
403	W is -O-, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
404	W is -O-, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
405	W is -O-, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
406	W is -O-, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
407	W is -O-, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
408	W is -O-, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
409	W is -O-, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
410	W is -O-, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is H, and
411	W is -O-, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
412	W is -O-, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
413	W is -O-, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
414	W is -O-, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
415	W is -O-, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
416	W is -O-, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
417	W is -O-, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
418	W is -O-, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
419	W is -O-, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
420	W is -O-, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is H, and
421	W is -O-, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
422	W is -O-, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
423	W is -O-, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
424	W is -O-, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
425	W is -O-, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
426	W is -O-, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
427	W is -O-, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
428	W is -O-, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and

429	W is -O-, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
430	W is -O-, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is H, and
431	W is -O-, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
432	W is -O-, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
433	W is -O-, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is C(O)-i-Pr, and
434	W is -O-, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is C(O)-t-Bu, and
435	W is -O-, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
436	W is -O-, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
437	W is -O-, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is CO ₂ -i-Pr, and
438	W is -O-, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is CO ₂ -t-Bu, and
439	W is -O-, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
440	W is -O-, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is H, and
441	W is -O-, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
442	W is -O-, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
443	W is -O-, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is C(O)-i-Pr, and
444	W is -O-, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is C(O)-t-Bu, and
445	W is -O-, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
446	W is -O-, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
447	W is -O-, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is CO ₂ -i-Pr, and
448	W is -O-, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is CO ₂ -t-Bu, and
449	W is -O-, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
450	W is -O-, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is H, and
451	W is -O-, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
452	W is -O-, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
453	W is -O-, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is C(O)-i-Pr, and
454	W is -O-, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is C(O)-t-Bu, and
455	W is -O-, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
456	W is -O-, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
457	W is -O-, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is CO ₂ -i-Pr, and
458	W is -O-, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is CO ₂ -t-Bu, and
459	W is -O-, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
460	W is -O-, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is H, and
461	W is -O-, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
462	W is -O-, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
463	W is -O-, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is C(O)-i-Pr, and
464	W is -O-, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is C(O)-t-Bu, and
465	W is -O-, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and

466	W is -O-, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
467	W is -O-, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is CO ₂ -i-Pr, and
468	W is -O-, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is CO ₂ -t-Bu, and
469	W is -O-, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
470	W is -O-, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is H, and
471	W is -O-, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
472	W is -O-, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
473	W is -O-, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is C(O)-i-Pr, and
474	W is -O-, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is C(O)-t-Bu, and
475	W is -O-, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
476	W is -O-, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
477	W is -O-, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is CO ₂ -i-Pr, and
478	W is -O-, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is CO ₂ -t-Bu, and
479	W is -O-, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
480	W is -CH(CH ₃)-, R ¹ is Me, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is H, and
481	W is -CH(CH ₃)-, R ¹ is Me, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
482	W is -CH(CH ₃)-, R ¹ is Me, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
483	W is -CH(CH ₃)-, R ¹ is Me, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is C(O)-i-Pr, and
484	W is -CH(CH ₃)-, R ¹ is Me, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is C(O)-t-Bu, and
485	W is -CH(CH ₃)-, R ¹ is Me, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
486	W is -CH(CH ₃)-, R ¹ is Me, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
487	W is -CH(CH ₃)-, R ¹ is Me, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is CO ₂ -i-Pr, and
488	W is -CH(CH ₃)-, R ¹ is Me, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is CO ₂ -t-Bu, and
489	W is -CH(CH ₃)-, R ¹ is Me, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
490	W is -CH(CH ₃)-, R ¹ is Me, R ² is H, R ⁵ is H, R ⁶ is H, L-G is H, and
491	W is -CH(CH ₃)-, R ¹ is Me, R ² is H, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
492	W is -CH(CH ₃)-, R ¹ is Me, R ² is H, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
493	W is -CH(CH ₃)-, R ¹ is Me, R ² is H, R ⁵ is H, R ⁶ is H, L-G is C(O)-i-Pr, and
494	W is -CH(CH ₃)-, R ¹ is Me, R ² is H, R ⁵ is H, R ⁶ is H, L-G is C(O)-t-Bu, and
495	W is -CH(CH ₃)-, R ¹ is Me, R ² is H, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
496	W is -CH(CH ₃)-, R ¹ is Me, R ² is H, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
497	W is -CH(CH ₃)-, R ¹ is Me, R ² is H, R ⁵ is H, R ⁶ is H, L-G is CO ₂ -i-Pr, and
498	W is -CH(CH ₃)-, R ¹ is Me, R ² is H, R ⁵ is H, R ⁶ is H, L-G is CO ₂ -t-Bu, and
499	W is -CH(CH ₃)-, R ¹ is Me, R ² is H, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
500	W is -CH(CH ₃)-, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is H, and
501	W is -CH(CH ₃)-, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
502	W is -CH(CH ₃)-, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and

503	W is -CH(CH ₃)-, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
504	W is -CH(CH ₃)-, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
505	W is -CH(CH ₃)-, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
506	W is -CH(CH ₃)-, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
507	W is -CH(CH ₃)-, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
508	W is -CH(CH ₃)-, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
509	W is -CH(CH ₃)-, R ¹ is Me, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
510	W is -CH(CH ₃)-, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is H, and
511	W is -CH(CH ₃)-, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
512	W is -CH(CH ₃)-, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
513	W is -CH(CH ₃)-, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
514	W is -CH(CH ₃)-, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
515	W is -CH(CH ₃)-, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
516	W is -CH(CH ₃)-, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
517	W is -CH(CH ₃)-, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
518	W is -CH(CH ₃)-, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
519	W is -CH(CH ₃)-, R ¹ is Me, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
520	W is -CH(CH ₃)-, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is H, and
521	W is -CH(CH ₃)-, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
522	W is -CH(CH ₃)-, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
523	W is -CH(CH ₃)-, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
524	W is -CH(CH ₃)-, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
525	W is -CH(CH ₃)-, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
526	W is -CH(CH ₃)-, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
527	W is -CH(CH ₃)-, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
528	W is -CH(CH ₃)-, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
529	W is -CH(CH ₃)-, R ¹ is Me, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
530	W is -CH(CH ₃)-, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is H, and
531	W is -CH(CH ₃)-, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
532	W is -CH(CH ₃)-, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
533	W is -CH(CH ₃)-, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
534	W is -CH(CH ₃)-, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
535	W is -CH(CH ₃)-, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
536	W is -CH(CH ₃)-, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
537	W is -CH(CH ₃)-, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
538	W is -CH(CH ₃)-, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
539	W is -CH(CH ₃)-, R ¹ is Me, R ² is I, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and

540	W is -CH(CH ₃)-, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is H, and
541	W is -CH(CH ₃)-, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
542	W is -CH(CH ₃)-, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
543	W is -CH(CH ₃)-, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
544	W is -CH(CH ₃)-, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
545	W is -CH(CH ₃)-, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
546	W is -CH(CH ₃)-, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
547	W is -CH(CH ₃)-, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
548	W is -CH(CH ₃)-, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
549	W is -CH(CH ₃)-, R ¹ is Me, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
550	W is -CH(CH ₃)-, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is H, and
551	W is -CH(CH ₃)-, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
552	W is -CH(CH ₃)-, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
553	W is -CH(CH ₃)-, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
554	W is -CH(CH ₃)-, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
555	W is -CH(CH ₃)-, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
556	W is -CH(CH ₃)-, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
557	W is -CH(CH ₃)-, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
558	W is -CH(CH ₃)-, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
559	W is -CH(CH ₃)-, R ¹ is Me, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
560	W is -CH(CH ₃)-, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is H, and
561	W is -CH(CH ₃)-, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
562	W is -CH(CH ₃)-, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
563	W is -CH(CH ₃)-, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
564	W is -CH(CH ₃)-, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
565	W is -CH(CH ₃)-, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
566	W is -CH(CH ₃)-, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
567	W is -CH(CH ₃)-, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
568	W is -CH(CH ₃)-, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
569	W is -CH(CH ₃)-, R ¹ is Et, R ² is Me, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
570	W is -CH(CH ₃)-, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is H, and
571	W is -CH(CH ₃)-, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
572	W is -CH(CH ₃)-, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
573	W is -CH(CH ₃)-, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
574	W is -CH(CH ₃)-, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
575	W is -CH(CH ₃)-, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
576	W is -CH(CH ₃)-, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and

577	W is -CH(CH ₃)-, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
578	W is -CH(CH ₃)-, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
579	W is -CH(CH ₃)-, R ¹ is Et, R ² is H, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
580	W is -CH(CH ₃)-, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is H, and
581	W is -CH(CH ₃)-, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
582	W is -CH(CH ₃)-, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
583	W is -CH(CH ₃)-, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
584	W is -CH(CH ₃)-, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
585	W is -CH(CH ₃)-, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
586	W is -CH(CH ₃)-, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
587	W is -CH(CH ₃)-, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
588	W is -CH(CH ₃)-, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
589	W is -CH(CH ₃)-, R ¹ is Et, R ² is CF ₃ , R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
590	W is -CH(CH ₃)-, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is H, and
591	W is -CH(CH ₃)-, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
592	W is -CH(CH ₃)-, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
593	W is -CH(CH ₃)-, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
594	W is -CH(CH ₃)-, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
595	W is -CH(CH ₃)-, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
596	W is -CH(CH ₃)-, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
597	W is -CH(CH ₃)-, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
598	W is -CH(CH ₃)-, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
599	W is -CH(CH ₃)-, R ¹ is Et, R ² is Cl, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
600	W is -CH(CH ₃)-, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is H, and
601	W is -CH(CH ₃)-, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
602	W is -CH(CH ₃)-, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
603	W is -CH(CH ₃)-, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
604	W is -CH(CH ₃)-, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
605	W is -CH(CH ₃)-, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
606	W is -CH(CH ₃)-, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
607	W is -CH(CH ₃)-, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
608	W is -CH(CH ₃)-, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
609	W is -CH(CH ₃)-, R ¹ is Et, R ² is Br, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
610	W is -CH(CH ₃)-, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is H, and
611	W is -CH(CH ₃)-, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
612	W is -CH(CH ₃)-, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
613	W is -CH(CH ₃)-, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and

614	W is -CH(CH ₃)-, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
615	W is -CH(CH ₃)-, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
616	W is -CH(CH ₃)-, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
617	W is -CH(CH ₃)-, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
618	W is -CH(CH ₃)-, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
619	W is -CH(CH ₃)-, R ¹ is Et, R ² is I, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
620	W is -CH(CH ₃)-, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is H, and
621	W is -CH(CH ₃)-, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
622	W is -CH(CH ₃)-, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
623	W is -CH(CH ₃)-, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
624	W is -CH(CH ₃)-, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
625	W is -CH(CH ₃)-, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
626	W is -CH(CH ₃)-, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
627	W is -CH(CH ₃)-, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
628	W is -CH(CH ₃)-, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
629	W is -CH(CH ₃)-, R ¹ is Et, R ² is OMe, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
630	W is -CH(CH ₃)-, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is H, and
631	W is -CH(CH ₃)-, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is C(O)Me, and
632	W is -CH(CH ₃)-, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is C(O)Et, and
633	W is -CH(CH ₃)-, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
634	W is -CH(CH ₃)-, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
635	W is -CH(CH ₃)-, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Me, and
636	W is -CH(CH ₃)-, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is CO ₂ Et, and
637	W is -CH(CH ₃)-, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
638	W is -CH(CH ₃)-, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
639	W is -CH(CH ₃)-, R ¹ is Et, R ² is CN, R ⁵ is H, R ⁶ is H, L-G is SO ₂ Me, and
640	W is -CH ₂ -, R ¹ is Me, R ² is Me, R ⁵ is CH ₃ , R ⁶ is H, L-G is H, and
641	W is -CH ₂ -, R ¹ is Me, R ² is Me, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)Me, and
642	W is -CH ₂ -, R ¹ is Me, R ² is Me, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)Et, and
643	W is -CH ₂ -, R ¹ is Me, R ² is Me, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
644	W is -CH ₂ -, R ¹ is Me, R ² is Me, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
645	W is -CH ₂ -, R ¹ is Me, R ² is Me, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ Me, and
646	W is -CH ₂ -, R ¹ is Me, R ² is Me, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ Et, and
647	W is -CH ₂ -, R ¹ is Me, R ² is Me, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
648	W is -CH ₂ -, R ¹ is Me, R ² is Me, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
649	W is -CH ₂ -, R ¹ is Me, R ² is Me, R ⁵ is CH ₃ , R ⁶ is H, L-G is SO ₂ Me, and
650	W is -CH ₂ -, R ¹ is Me, R ² is H, R ⁵ is CH ₃ , R ⁶ is H, L-G is H, and

651	W is -CH ₂ -, R ¹ is Me, R ² is H, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)Me, and
652	W is -CH ₂ -, R ¹ is Me, R ² is H, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)Et, and
653	W is -CH ₂ -, R ¹ is Me, R ² is H, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)-i-Pr, and
654	W is -CH ₂ -, R ¹ is Me, R ² is H, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)-t-Bu, and
655	W is -CH ₂ -, R ¹ is Me, R ² is H, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ Me, and
656	W is -CH ₂ -, R ¹ is Me, R ² is H, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ Et, and
657	W is -CH ₂ -, R ¹ is Me, R ² is H, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ -i-Pr, and
658	W is -CH ₂ -, R ¹ is Me, R ² is H, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ -t-Bu, and
659	W is -CH ₂ -, R ¹ is Me, R ² is H, R ⁵ is CH ₃ , R ⁶ is H, L-G is SO ₂ Me, and
660	W is -CH ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ is H, L-G is H, and
661	W is -CH ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)Me, and
662	W is -CH ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)Et, and
663	W is -CH ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)-i-Pr, and
664	W is -CH ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)-t-Bu, and
665	W is -CH ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ Me, and
666	W is -CH ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ Et, and
667	W is -CH ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ -i-Pr, and
668	W is -CH ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ -t-Bu, and
669	W is -CH ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ is H, L-G is SO ₂ Me, and
670	W is -CH ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is CH ₃ , R ⁶ is H, L-G is H, and
671	W is -CH ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)Me, and
672	W is -CH ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)Et, and
673	W is -CH ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)-i-Pr, and
674	W is -CH ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)-t-Bu, and
675	W is -CH ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ Me, and
676	W is -CH ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ Et, and
677	W is -CH ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ -i-Pr, and
678	W is -CH ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ -t-Bu, and
679	W is -CH ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is CH ₃ , R ⁶ is H, L-G is SO ₂ Me, and
680	W is -CH ₂ -, R ¹ is Me, R ² is Br, R ⁵ is CH ₃ , R ⁶ is H, L-G is H, and
681	W is -CH ₂ -, R ¹ is Me, R ² is Br, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)Me, and
682	W is -CH ₂ -, R ¹ is Me, R ² is Br, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)Et, and
683	W is -CH ₂ -, R ¹ is Me, R ² is Br, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)-i-Pr, and
684	W is -CH ₂ -, R ¹ is Me, R ² is Br, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)-t-Bu, and
685	W is -CH ₂ -, R ¹ is Me, R ² is Br, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ Me, and
686	W is -CH ₂ -, R ¹ is Me, R ² is Br, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ Et, and
687	W is -CH ₂ -, R ¹ is Me, R ² is Br, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ -i-Pr, and

688	W is -CH ₂ -, R ¹ is Me, R ² is Br, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
689	W is -CH ₂ -, R ¹ is Me, R ² is Br, R ⁵ is CH ₃ , R ⁶ is H, L-G is SO ₂ Me, and
690	W is -CH ₂ -, R ¹ is Me, R ² is I, R ⁵ is CH ₃ , R ⁶ is H, L-G is H, and
691	W is -CH ₂ -, R ¹ is Me, R ² is I, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)Me, and
692	W is -CH ₂ -, R ¹ is Me, R ² is I, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)Et, and
693	W is -CH ₂ -, R ¹ is Me, R ² is I, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
694	W is -CH ₂ -, R ¹ is Me, R ² is I, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
695	W is -CH ₂ -, R ¹ is Me, R ² is I, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ Me, and
696	W is -CH ₂ -, R ¹ is Me, R ² is I, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ Et, and
697	W is -CH ₂ -, R ¹ is Me, R ² is I, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
698	W is -CH ₂ -, R ¹ is Me, R ² is I, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
699	W is -CH ₂ -, R ¹ is Me, R ² is I, R ⁵ is CH ₃ , R ⁶ is H, L-G is SO ₂ Me, and
700	W is -CH ₂ -, R ¹ is Me, R ² is OMe, R ⁵ is CH ₃ , R ⁶ is H, L-G is H, and
701	W is -CH ₂ -, R ¹ is Me, R ² is OMe, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)Me, and
702	W is -CH ₂ -, R ¹ is Me, R ² is OMe, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)Et, and
703	W is -CH ₂ -, R ¹ is Me, R ² is OMe, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
704	W is -CH ₂ -, R ¹ is Me, R ² is OMe, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
705	W is -CH ₂ -, R ¹ is Me, R ² is OMe, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ Me, and
706	W is -CH ₂ -, R ¹ is Me, R ² is OMe, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ Et, and
707	W is -CH ₂ -, R ¹ is Me, R ² is OMe, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
708	W is -CH ₂ -, R ¹ is Me, R ² is OMe, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
709	W is -CH ₂ -, R ¹ is Me, R ² is OMe, R ⁵ is CH ₃ , R ⁶ is H, L-G is SO ₂ Me, and
710	W is -CH ₂ -, R ¹ is Me, R ² is CN, R ⁵ is CH ₃ , R ⁶ is H, L-G is H, and
711	W is -CH ₂ -, R ¹ is Me, R ² is CN, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)Me, and
712	W is -CH ₂ -, R ¹ is Me, R ² is CN, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)Et, and
713	W is -CH ₂ -, R ¹ is Me, R ² is CN, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
714	W is -CH ₂ -, R ¹ is Me, R ² is CN, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
715	W is -CH ₂ -, R ¹ is Me, R ² is CN, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ Me, and
716	W is -CH ₂ -, R ¹ is Me, R ² is CN, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ Et, and
717	W is -CH ₂ -, R ¹ is Me, R ² is CN, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
718	W is -CH ₂ -, R ¹ is Me, R ² is CN, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
719	W is -CH ₂ -, R ¹ is Me, R ² is CN, R ⁵ is CH ₃ , R ⁶ is H, L-G is SO ₂ Me, and
720	W is -CH ₂ -, R ¹ is Et, R ² is Me, R ⁵ is CH ₃ , R ⁶ is H, L-G is H, and
721	W is -CH ₂ -, R ¹ is Et, R ² is Me, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)Me, and
722	W is -CH ₂ -, R ¹ is Et, R ² is Me, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)Et, and
723	W is -CH ₂ -, R ¹ is Et, R ² is Me, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
724	W is -CH ₂ -, R ¹ is Et, R ² is Me, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and

725	W is -CH ₂ -, R ¹ is Et, R ² is Me, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ Me, and
726	W is -CH ₂ -, R ¹ is Et, R ² is Me, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ Et, and
727	W is -CH ₂ -, R ¹ is Et, R ² is Me, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ -i-Pr, and
728	W is -CH ₂ -, R ¹ is Et, R ² is Me, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ -t-Bu, and
729	W is -CH ₂ -, R ¹ is Et, R ² is Me, R ⁵ is CH ₃ , R ⁶ is H, L-G is SO ₂ Me, and
730	W is -CH ₂ -, R ¹ is Et, R ² is H, R ⁵ is CH ₃ , R ⁶ is H, L-G is H, and
731	W is -CH ₂ -, R ¹ is Et, R ² is H, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)Me, and
732	W is -CH ₂ -, R ¹ is Et, R ² is H, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)Et, and
733	W is -CH ₂ -, R ¹ is Et, R ² is H, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)-i-Pr, and
734	W is -CH ₂ -, R ¹ is Et, R ² is H, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)-t-Bu, and
735	W is -CH ₂ -, R ¹ is Et, R ² is H, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ Me, and
736	W is -CH ₂ -, R ¹ is Et, R ² is H, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ Et, and
737	W is -CH ₂ -, R ¹ is Et, R ² is H, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ -i-Pr, and
738	W is -CH ₂ -, R ¹ is Et, R ² is H, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ -t-Bu, and
739	W is -CH ₂ -, R ¹ is Et, R ² is H, R ⁵ is CH ₃ , R ⁶ is H, L-G is SO ₂ Me, and
740	W is -CH ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ is H, L-G is H, and
741	W is -CH ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)Me, and
742	W is -CH ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)Et, and
743	W is -CH ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)-i-Pr, and
744	W is -CH ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)-t-Bu, and
745	W is -CH ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ Me, and
746	W is -CH ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ Et, and
747	W is -CH ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ -i-Pr, and
748	W is -CH ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ -t-Bu, and
749	W is -CH ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ is H, L-G is SO ₂ Me, and
750	W is -CH ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is CH ₃ , R ⁶ is H, L-G is H, and
751	W is -CH ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)Me, and
752	W is -CH ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)Et, and
753	W is -CH ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)-i-Pr, and
754	W is -CH ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)-t-Bu, and
755	W is -CH ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ Me, and
756	W is -CH ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ Et, and
757	W is -CH ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ -i-Pr, and
758	W is -CH ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ -t-Bu, and
759	W is -CH ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is CH ₃ , R ⁶ is H, L-G is SO ₂ Me, and
760	W is -CH ₂ -, R ¹ is Et, R ² is Br, R ⁵ is CH ₃ , R ⁶ is H, L-G is H, and
761	W is -CH ₂ -, R ¹ is Et, R ² is Br, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)Me, and

762	W is -CH ₂ -, R ¹ is Et, R ² is Br, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)Et, and
763	W is -CH ₂ -, R ¹ is Et, R ² is Br, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
764	W is -CH ₂ -, R ¹ is Et, R ² is Br, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
765	W is -CH ₂ -, R ¹ is Et, R ² is Br, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ Me, and
766	W is -CH ₂ -, R ¹ is Et, R ² is Br, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ Et, and
767	W is -CH ₂ -, R ¹ is Et, R ² is Br, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
768	W is -CH ₂ -, R ¹ is Et, R ² is Br, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
769	W is -CH ₂ -, R ¹ is Et, R ² is Br, R ⁵ is CH ₃ , R ⁶ is H, L-G is SO ₂ Me, and
770	W is -CH ₂ -, R ¹ is Et, R ² is I, R ⁵ is CH ₃ , R ⁶ is H, L-G is H, and
771	W is -CH ₂ -, R ¹ is Et, R ² is I, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)Me, and
772	W is -CH ₂ -, R ¹ is Et, R ² is I, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)Et, and
773	W is -CH ₂ -, R ¹ is Et, R ² is I, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
774	W is -CH ₂ -, R ¹ is Et, R ² is I, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
775	W is -CH ₂ -, R ¹ is Et, R ² is I, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ Me, and
776	W is -CH ₂ -, R ¹ is Et, R ² is I, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ Et, and
777	W is -CH ₂ -, R ¹ is Et, R ² is I, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
778	W is -CH ₂ -, R ¹ is Et, R ² is I, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
779	W is -CH ₂ -, R ¹ is Et, R ² is I, R ⁵ is CH ₃ , R ⁶ is H, L-G is SO ₂ Me, and
780	W is -CH ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is CH ₃ , R ⁶ is H, L-G is H, and
781	W is -CH ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)Me, and
782	W is -CH ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)Et, and
783	W is -CH ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
784	W is -CH ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
785	W is -CH ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ Me, and
786	W is -CH ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ Et, and
787	W is -CH ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
788	W is -CH ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and
789	W is -CH ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is CH ₃ , R ⁶ is H, L-G is SO ₂ Me, and
790	W is -CH ₂ -, R ¹ is Et, R ² is CN, R ⁵ is CH ₃ , R ⁶ is H, L-G is H, and
791	W is -CH ₂ -, R ¹ is Et, R ² is CN, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)Me, and
792	W is -CH ₂ -, R ¹ is Et, R ² is CN, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)Et, and
793	W is -CH ₂ -, R ¹ is Et, R ² is CN, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)- <i>i</i> -Pr, and
794	W is -CH ₂ -, R ¹ is Et, R ² is CN, R ⁵ is CH ₃ , R ⁶ is H, L-G is C(O)- <i>t</i> -Bu, and
795	W is -CH ₂ -, R ¹ is Et, R ² is CN, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ Me, and
796	W is -CH ₂ -, R ¹ is Et, R ² is CN, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ Et, and
797	W is -CH ₂ -, R ¹ is Et, R ² is CN, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ - <i>i</i> -Pr, and
798	W is -CH ₂ -, R ¹ is Et, R ² is CN, R ⁵ is CH ₃ , R ⁶ is H, L-G is CO ₂ - <i>t</i> -Bu, and

799	W is -CH ₂ -, R ¹ is Et, R ² is CN, R ⁵ is CH ₃ , R ⁶ is H, L-G is SO ₂ Me, and
800	W is -CH ₂ -, R ¹ is Me, R ² is Me, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is H, and
801	W is -CH ₂ -, R ¹ is Me, R ² is Me, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)Me, and
802	W is -CH ₂ -, R ¹ is Me, R ² is Me, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)Et, and
803	W is -CH ₂ -, R ¹ is Me, R ² is Me, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)- <i>i</i> -Pr, and
804	W is -CH ₂ -, R ¹ is Me, R ² is Me, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)- <i>t</i> -Bu, and
805	W is -CH ₂ -, R ¹ is Me, R ² is Me, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ Me, and
806	W is -CH ₂ -, R ¹ is Me, R ² is Me, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ Et, and
807	W is -CH ₂ -, R ¹ is Me, R ² is Me, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ - <i>i</i> -Pr, and
808	W is -CH ₂ -, R ¹ is Me, R ² is Me, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ - <i>t</i> -Bu, and
809	W is -CH ₂ -, R ¹ is Me, R ² is Me, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is SO ₂ Me, and
810	W is -CH ₂ -, R ¹ is Me, R ² is H, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is H, and
811	W is -CH ₂ -, R ¹ is Me, R ² is H, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)Me, and
812	W is -CH ₂ -, R ¹ is Me, R ² is H, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)Et, and
813	W is -CH ₂ -, R ¹ is Me, R ² is H, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)- <i>i</i> -Pr, and
814	W is -CH ₂ -, R ¹ is Me, R ² is H, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)- <i>t</i> -Bu, and
815	W is -CH ₂ -, R ¹ is Me, R ² is H, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ Me, and
816	W is -CH ₂ -, R ¹ is Me, R ² is H, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ Et, and
817	W is -CH ₂ -, R ¹ is Me, R ² is H, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ - <i>i</i> -Pr, and
818	W is -CH ₂ -, R ¹ is Me, R ² is H, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ - <i>t</i> -Bu, and
819	W is -CH ₂ -, R ¹ is Me, R ² is H, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is SO ₂ Me, and
820	W is -CH ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is H, and
821	W is -CH ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)Me, and
822	W is -CH ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)Et, and
823	W is -CH ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)- <i>i</i> -Pr, and
824	W is -CH ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)- <i>t</i> -Bu, and
825	W is -CH ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ Me, and
826	W is -CH ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ Et, and
827	W is -CH ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ - <i>i</i> -Pr, and
828	W is -CH ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ - <i>t</i> -Bu, and
829	W is -CH ₂ -, R ¹ is Me, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is SO ₂ Me, and
830	W is -CH ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is H, and
831	W is -CH ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)Me, and
832	W is -CH ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)Et, and
833	W is -CH ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)- <i>i</i> -Pr, and
834	W is -CH ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)- <i>t</i> -Bu, and
835	W is -CH ₂ -, R ¹ is Me, R ² is Cl, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ Me, and

873	W is -CH ₂ -, R ¹ is Me, R ² is CN, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)- <i>i</i> -Pr, and
874	W is -CH ₂ -, R ¹ is Me, R ² is CN, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)- <i>t</i> -Bu, and
875	W is -CH ₂ -, R ¹ is Me, R ² is CN, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ Me, and
876	W is -CH ₂ -, R ¹ is Me, R ² is CN, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ Et, and
877	W is -CH ₂ -, R ¹ is Me, R ² is CN, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ - <i>i</i> -Pr, and
878	W is -CH ₂ -, R ¹ is Me, R ² is CN, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ - <i>t</i> -Bu, and
879	W is -CH ₂ -, R ¹ is Et, R ² is CN, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is SO ₂ Me, and
880	W is -CH ₂ -, R ¹ is Et, R ² is Me, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is H, and
881	W is -CH ₂ -, R ¹ is Et, R ² is Me, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)Me, and
882	W is -CH ₂ -, R ¹ is Et, R ² is Me, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)Et, and
883	W is -CH ₂ -, R ¹ is Et, R ² is Me, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)- <i>i</i> -Pr, and
884	W is -CH ₂ -, R ¹ is Et, R ² is Me, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)- <i>t</i> -Bu, and
885	W is -CH ₂ -, R ¹ is Et, R ² is Me, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ Me, and
886	W is -CH ₂ -, R ¹ is Et, R ² is Me, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ Et, and
887	W is -CH ₂ -, R ¹ is Et, R ² is Me, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ - <i>i</i> -Pr, and
888	W is -CH ₂ -, R ¹ is Et, R ² is Me, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ - <i>t</i> -Bu, and
889	W is -CH ₂ -, R ¹ is Et, R ² is Me, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is SO ₂ Me, and
890	W is -CH ₂ -, R ¹ is Et, R ² is H, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is H, and
891	W is -CH ₂ -, R ¹ is Et, R ² is H, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)Me, and
892	W is -CH ₂ -, R ¹ is Et, R ² is H, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)Et, and
893	W is -CH ₂ -, R ¹ is Et, R ² is H, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)- <i>i</i> -Pr, and
894	W is -CH ₂ -, R ¹ is Et, R ² is H, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)- <i>t</i> -Bu, and
895	W is -CH ₂ -, R ¹ is Et, R ² is H, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ Me, and
896	W is -CH ₂ -, R ¹ is Et, R ² is H, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ Et, and
897	W is -CH ₂ -, R ¹ is Et, R ² is H, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ - <i>i</i> -Pr, and
898	W is -CH ₂ -, R ¹ is Et, R ² is H, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ - <i>t</i> -Bu, and
899	W is -CH ₂ -, R ¹ is Et, R ² is H, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is SO ₂ Me, and
900	W is -CH ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is H, and
901	W is -CH ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)Me, and
902	W is -CH ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)Et, and
903	W is -CH ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)- <i>i</i> -Pr, and
904	W is -CH ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)- <i>t</i> -Bu, and
905	W is -CH ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ Me, and
906	W is -CH ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ Et, and
907	W is -CH ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ - <i>i</i> -Pr, and
908	W is -CH ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ - <i>t</i> -Bu, and
909	W is -CH ₂ -, R ¹ is Et, R ² is CF ₃ , R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is SO ₂ Me, and

910	W is -CH ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is H, and
911	W is -CH ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)Me, and
912	W is -CH ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)Et, and
913	W is -CH ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)-i-Pr, and
914	W is -CH ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)-t-Bu, and
915	W is -CH ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ Me, and
916	W is -CH ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ Et, and
917	W is -CH ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ -i-Pr, and
918	W is -CH ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ -t-Bu, and
919	W is -CH ₂ -, R ¹ is Et, R ² is Cl, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is SO ₂ Me, and
920	W is -CH ₂ -, R ¹ is Et, R ² is Br, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is H, and
921	W is -CH ₂ -, R ¹ is Et, R ² is Br, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)Me, and
922	W is -CH ₂ -, R ¹ is Et, R ² is Br, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)Et, and
923	W is -CH ₂ -, R ¹ is Et, R ² is Br, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)-i-Pr, and
924	W is -CH ₂ -, R ¹ is Et, R ² is Br, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)-t-Bu, and
925	W is -CH ₂ -, R ¹ is Et, R ² is Br, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ Me, and
926	W is -CH ₂ -, R ¹ is Et, R ² is Br, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ Et, and
927	W is -CH ₂ -, R ¹ is Et, R ² is Br, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ -i-Pr, and
928	W is -CH ₂ -, R ¹ is Et, R ² is Br, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ -t-Bu, and
929	W is -CH ₂ -, R ¹ is Et, R ² is Br, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is SO ₂ Me, and
930	W is -CH ₂ -, R ¹ is Et, R ² is I, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is H, and
931	W is -CH ₂ -, R ¹ is Et, R ² is I, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)Me, and
932	W is -CH ₂ -, R ¹ is Et, R ² is I, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)Et, and
933	W is -CH ₂ -, R ¹ is Et, R ² is I, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)-i-Pr, and
934	W is -CH ₂ -, R ¹ is Et, R ² is I, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)-t-Bu, and
935	W is -CH ₂ -, R ¹ is Et, R ² is I, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ Me, and
936	W is -CH ₂ -, R ¹ is Et, R ² is I, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ Et, and
937	W is -CH ₂ -, R ¹ is Et, R ² is I, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ -i-Pr, and
938	W is -CH ₂ -, R ¹ is Et, R ² is I, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ -t-Bu, and
939	W is -CH ₂ -, R ¹ is Et, R ² is I, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is SO ₂ Me, and
940	W is -CH ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is H, and
941	W is -CH ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)Me, and
942	W is -CH ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)Et, and
943	W is -CH ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)-i-Pr, and
944	W is -CH ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is C(O)-t-Bu, and
945	W is -CH ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ Me, and
946	W is -CH ₂ -, R ¹ is Et, R ² is OMe, R ⁵ is CH ₃ , R ⁶ CH ₃ , L-G is CO ₂ Et, and

947	W is $-\text{CH}_2-$, R^1 is Et, R^2 is OMe, R^5 is CH_3 , R^6 CH_3 , L-G is CO_2 - <i>i</i> -Pr, and
948	W is $-\text{CH}_2-$, R^1 is Et, R^2 is OMe, R^5 is CH_3 , R^6 CH_3 , L-G is CO_2 - <i>t</i> -Bu, and
949	W is $-\text{CH}_2-$, R^1 is Et, R^2 is OMe, R^5 is CH_3 , R^6 CH_3 , L-G is SO_2 Me, and
950	W is $-\text{CH}_2-$, R^1 is Et, R^2 is CN, R^5 is CH_3 , R^6 CH_3 , L-G is H, and
951	W is $-\text{CH}_2-$, R^1 is Et, R^2 is CN, R^5 is CH_3 , R^6 CH_3 , L-G is C(O)Me, and
952	W is $-\text{CH}_2-$, R^1 is Et, R^2 is CN, R^5 is CH_3 , R^6 CH_3 , L-G is C(O)Et, and
953	W is $-\text{CH}_2-$, R^1 is Et, R^2 is CN, R^5 is CH_3 , R^6 CH_3 , L-G is C(O)- <i>i</i> -Pr, and
954	W is $-\text{CH}_2-$, R^1 is Et, R^2 is CN, R^5 is CH_3 , R^6 CH_3 , L-G is C(O)- <i>t</i> -Bu, and
955	W is $-\text{CH}_2-$, R^1 is Et, R^2 is CN, R^5 is CH_3 , R^6 CH_3 , L-G is CO_2 Me, and
956	W is $-\text{CH}_2-$, R^1 is Et, R^2 is CN, R^5 is CH_3 , R^6 CH_3 , L-G is CO_2 Et, and
957	W is $-\text{CH}_2-$, R^1 is Et, R^2 is CN, R^5 is CH_3 , R^6 CH_3 , L-G is CO_2 - <i>i</i> -Pr, and
958	W is $-\text{CH}_2-$, R^1 is Et, R^2 is CN, R^5 is CH_3 , R^6 CH_3 , L-G is CO_2 - <i>t</i> -Bu, and
959	W is $-\text{CH}_2-$, R^1 is Et, R^2 is CN, R^5 is CH_3 , R^6 CH_3 , L-G is SO_2 Me, and

A compound of this invention will generally be used as a herbicidal active ingredient in a composition, i.e. formulation, with at least one additional component selected from the group consisting of surfactants, solid diluents and liquid diluents, which serves as a carrier.

- 5 The formulation or composition ingredients are selected to be consistent with the physical properties of the active ingredient, mode of application and environmental factors such as soil type, moisture and temperature.

Useful formulations include both liquid and solid compositions. Liquid compositions include solutions (including emulsifiable concentrates), suspensions, emulsions (including microemulsions, oil-in -water emulsions, flowable concentrates and/or suspoemulsions) and the like, which optionally can be thickened into gels. The general types of aqueous liquid compositions are soluble concentrate, suspension concentrate, capsule suspension, concentrated emulsion, microemulsion, oil-in-water emulsion, flowable concentrate and suspo-emulsion. The general types of nonaqueous liquid compositions are emulsifiable concentrate, microemulsifiable concentrate, dispersible concentrate and oil dispersion.

The general types of solid compositions are dusts, powders, granules, pellets, prills, pastilles, tablets, filled films (including seed coatings) and the like, which can be water-dispersible (“wetable”) or water-soluble. Films and coatings formed from film-forming solutions or flowable suspensions are particularly useful for seed treatment. Active ingredient can be (micro)encapsulated and further formed into a suspension or solid formulation; alternatively the entire formulation of active ingredient can be encapsulated (or “overcoated”). Encapsulation can control or delay release of the active ingredient. An emulsifiable granule combines the advantages of both an emulsifiable concentrate

formulation and a dry granular formulation. High-strength compositions are primarily used as intermediates for further formulation.

Sprayable formulations are typically extended in a suitable medium before spraying. Such liquid and solid formulations are formulated to be readily diluted in the spray medium, usually water, but occasionally another suitable medium like an aromatic or paraffinic hydrocarbon or vegetable oil. Spray volumes can range from about one to several thousand liters per hectare, but more typically are in the range from about ten to several hundred liters per hectare. Sprayable formulations can be tank mixed with water or another suitable medium for foliar treatment by aerial or ground application, or for application to the growing medium of the plant. Liquid and dry formulations can be metered directly into drip irrigation systems or metered into the furrow during planting.

The formulations will typically contain effective amounts of active ingredient, diluent and surfactant within the following approximate ranges which add up to 100 percent by weight.

	Weight Percent		
	<u>Active Ingredient</u>	<u>Diluent</u>	<u>Surfactant</u>
Water-Dispersible and Water-soluble Granules, Tablets and Powders	0.001–90	0–99.999	0–15
Oil Dispersions, Suspensions, Emulsions, Solutions (including Emulsifiable Concentrates)	1–50	40–99	0–50
Dusts	1–25	70–99	0–5
Granules and Pellets	0.001–99	5–99.999	0–15
High Strength Compositions	90–99	0–10	0–2

Solid diluents include, for example, clays such as bentonite, montmorillonite, attapulgite and kaolin, gypsum, cellulose, titanium dioxide, zinc oxide, starch, dextrin, sugars (e.g., lactose, sucrose), silica, talc, mica, diatomaceous earth, urea, calcium carbonate, sodium carbonate and bicarbonate, and sodium sulfate. Typical solid diluents are described in Watkins et al., *Handbook of Insecticide Dust Diluents and Carriers*, 2nd Ed., Dorland Books, Caldwell, New Jersey.

Liquid diluents include, for example, water, *N,N*-dimethylalkanamides (e.g., *N,N*-dimethylformamide), limonene, dimethyl sulfoxide, *N*-alkylpyrrolidones (e.g., *N*-methylpyrrolidinone), alkyl phosphates (e.g., triethyl phosphate), ethylene glycol, triethylene glycol, propylene glycol, dipropylene glycol, polypropylene glycol, propylene carbonate, butylene carbonate, paraffins (e.g., white mineral oils, normal paraffins, isoparaffins), alkylbenzenes, alkylnaphthalenes, glycerine, glycerol triacetate, sorbitol,

aromatic hydrocarbons, dearomatized aliphatics, alkylbenzenes, alkylnaphthalenes, ketones such as cyclohexanone, 2-heptanone, isophorone and 4-hydroxy-4-methyl-2-pentanone, acetates such as isoamyl acetate, hexyl acetate, heptyl acetate, octyl acetate, nonyl acetate, tridecyl acetate and isobornyl acetate, other esters such as alkylated lactate esters, dibasic
5 esters, alkyl and aryl benzoates and γ -butyrolactone, and alcohols, which can be linear, branched, saturated or unsaturated, such as methanol, ethanol, *n*-propanol, isopropyl alcohol, *n*-butanol, isobutyl alcohol, *n*-hexanol, 2-ethylhexanol, *n*-octanol, decanol, isodecyl alcohol, isooctadecanol, cetyl alcohol, lauryl alcohol, tridecyl alcohol, oleyl alcohol, cyclohexanol, tetrahydrofurfuryl alcohol, diacetone alcohol, cresol and benzyl alcohol. Liquid diluents also
10 include glycerol esters of saturated and unsaturated fatty acids (typically C_6 – C_{22}), such as plant seed and fruit oils (e.g., oils of olive, castor, linseed, sesame, corn (maize), peanut, sunflower, grapeseed, safflower, cottonseed, soybean, rapeseed, coconut and palm kernel), animal-sourced fats (e.g., beef tallow, pork tallow, lard, cod liver oil, fish oil), and mixtures thereof. Liquid diluents also include alkylated fatty acids (e.g.,
15 methylated, ethylated, butylated) wherein the fatty acids may be obtained by hydrolysis of glycerol esters from plant and animal sources, and can be purified by distillation. Typical liquid diluents are described in Marsden, *Solvents Guide*, 2nd Ed., Interscience, New York, 1950.

The solid and liquid compositions of the present invention often include one or more
20 surfactants. When added to a liquid, surfactants (also known as “surface-active agents”) generally modify, most often reduce, the surface tension of the liquid. Depending on the nature of the hydrophilic and lipophilic groups in a surfactant molecule, surfactants can be useful as wetting agents, dispersants, emulsifiers or defoaming agents.

Surfactants can be classified as nonionic, anionic or cationic. Nonionic surfactants
25 useful for the present compositions include, but are not limited to: alcohol alkoxylates such as alcohol alkoxylates based on natural and synthetic alcohols (which may be branched or linear) and prepared from the alcohols and ethylene oxide, propylene oxide, butylene oxide or mixtures thereof; amine ethoxylates, alkanolamides and ethoxylated alkanolamides; alkoxylated triglycerides such as ethoxylated soybean, castor and rapeseed oils; alkylphenol
30 alkoxylates such as octylphenol ethoxylates, nonylphenol ethoxylates, dinonyl phenol ethoxylates and dodecyl phenol ethoxylates (prepared from the phenols and ethylene oxide, propylene oxide, butylene oxide or mixtures thereof); block polymers prepared from ethylene oxide or propylene oxide and reverse block polymers where the terminal blocks are prepared from propylene oxide; ethoxylated fatty acids; ethoxylated fatty esters and oils;
35 ethoxylated methyl esters; ethoxylated tristyrylphenol (including those prepared from ethylene oxide, propylene oxide, butylene oxide or mixtures thereof); fatty acid esters, glycerol esters, lanolin-based derivatives, polyethoxylate esters such as polyethoxylated sorbitan fatty acid esters, polyethoxylated sorbitol fatty acid esters and polyethoxylated

glycerol fatty acid esters; other sorbitan derivatives such as sorbitan esters; polymeric surfactants such as random copolymers, block copolymers, alkyd peg (polyethylene glycol) resins, graft or comb polymers and star polymers; polyethylene glycols (pegs); polyethylene glycol fatty acid esters; silicone-based surfactants; and sugar-derivatives such as sucrose esters, alkyl polyglycosides and alkyl polysaccharides.

Useful anionic surfactants include, but are not limited to: alkylaryl sulfonic acids and their salts; carboxylated alcohol or alkylphenol ethoxylates; diphenyl sulfonate derivatives; lignin and lignin derivatives such as lignosulfonates; maleic or succinic acids or their anhydrides; olefin sulfonates; phosphate esters such as phosphate esters of alcohol alkoxylates, phosphate esters of alkylphenol alkoxylates and phosphate esters of styryl phenol ethoxylates; protein-based surfactants; sarcosine derivatives; styryl phenol ether sulfate; sulfates and sulfonates of oils and fatty acids; sulfates and sulfonates of ethoxylated alkylphenols; sulfates of alcohols; sulfates of ethoxylated alcohols; sulfonates of amines and amides such as *N,N*-alkyltaurates; sulfonates of benzene, cumene, toluene, xylene, and dodecyl and tridecylbenzenes; sulfonates of condensed naphthalenes; sulfonates of naphthalene and alkyl naphthalene; sulfonates of fractionated petroleum; sulfosuccinamates; and sulfosuccinates and their derivatives such as dialkyl sulfosuccinate salts.

Useful cationic surfactants include, but are not limited to: amides and ethoxylated amides; amines such as *N*-alkyl propanediamines, tripropylenetriamines and dipropylenetetramines, and ethoxylated amines, ethoxylated diamines and propoxylated amines (prepared from the amines and ethylene oxide, propylene oxide, butylene oxide or mixtures thereof); amine salts such as amine acetates and diamine salts; quaternary ammonium salts such as quaternary salts, ethoxylated quaternary salts and diquaternary salts; and amine oxides such as alkyldimethylamine oxides and bis-(2-hydroxyethyl)-alkylamine oxides.

Also useful for the present compositions are mixtures of nonionic and anionic surfactants or mixtures of nonionic and cationic surfactants. Nonionic, anionic and cationic surfactants and their recommended uses are disclosed in a variety of published references including *McCutcheon's Emulsifiers and Detergents*, annual American and International Editions published by McCutcheon's Division, The Manufacturing Confectioner Publishing Co.; Sisely and Wood, *Encyclopedia of Surface Active Agents*, Chemical Publ. Co., Inc., New York, 1964; and A. S. Davidson and B. Milwidsky, *Synthetic Detergents*, Seventh Edition, John Wiley and Sons, New York, 1987.

Compositions of this invention may also contain formulation auxiliaries and additives, known to those skilled in the art as formulation aids (some of which may be considered to also function as solid diluents, liquid diluents or surfactants). Such formulation auxiliaries and additives may control: pH (buffers), foaming during processing (antifoams such polyorganosiloxanes), sedimentation of active ingredients (suspending agents), viscosity

(thixotropic thickeners), in-container microbial growth (antimicrobials), product freezing (antifreezes), color (dyes/pigment dispersions), wash-off (film formers or stickers), evaporation (evaporation retardants), and other formulation attributes. Film formers include, for example, polyvinyl acetates, polyvinyl acetate copolymers, polyvinylpyrrolidone-vinyl acetate copolymer, polyvinyl alcohols, polyvinyl alcohol copolymers and waxes. Examples of formulation auxiliaries and additives include those listed in *McCutcheon's Volume 2: Functional Materials*, annual International and North American editions published by McCutcheon's Division, The Manufacturing Confectioner Publishing Co.; and PCT Publication WO 03/024222.

The compound of Formula 1 and any other active ingredients are typically incorporated into the present compositions by dissolving the active ingredient in a solvent or by grinding in a liquid or dry diluent. Solutions, including emulsifiable concentrates, can be prepared by simply mixing the ingredients. If the solvent of a liquid composition intended for use as an emulsifiable concentrate is water-immiscible, an emulsifier is typically added to emulsify the active-containing solvent upon dilution with water. Active ingredient slurries, with particle diameters of up to 2,000 μm can be wet milled using media mills to obtain particles with average diameters below 3 μm . Aqueous slurries can be made into finished suspension concentrates (see, for example, U.S. 3,060,084) or further processed by spray drying to form water-dispersible granules. Dry formulations usually require dry milling processes, which produce average particle diameters in the 2 to 10 μm range. Dusts and powders can be prepared by blending and usually grinding (such as with a hammer mill or fluid-energy mill). Granules and pellets can be prepared by spraying the active material upon preformed granular carriers or by agglomeration techniques. See Browning, "Agglomeration", *Chemical Engineering*, December 4, 1967, pp 147–48, *Perry's Chemical Engineer's Handbook*, 4th Ed., McGraw-Hill, New York, 1963, pages 8–57 and following, and WO 91/13546. Pellets can be prepared as described in U.S. 4,172,714. Water-dispersible and water-soluble granules can be prepared as taught in U.S. 4,144,050, U.S. 3,920,442 and DE 3,246,493. Tablets can be prepared as taught in U.S. 5,180,587, U.S. 5,232,701 and U.S. 5,208,030. Films can be prepared as taught in GB 2,095,558 and U.S. 3,299,566.

For further information regarding the art of formulation, see T. S. Woods, "The Formulator's Toolbox – Product Forms for Modern Agriculture" in *Pesticide Chemistry and Bioscience, The Food–Environment Challenge*, T. Brooks and T. R. Roberts, Eds., Proceedings of the 9th International Congress on Pesticide Chemistry, The Royal Society of Chemistry, Cambridge, 1999, pp. 120–133. See also U.S. 3,235,361, Col. 6, line 16 through Col. 7, line 19 and Examples 10–41; U.S. 3,309,192, Col. 5, line 43 through Col. 7, line 62 and Examples 8, 12, 15, 39, 41, 52, 53, 58, 132, 138–140, 162–164, 166, 167 and 169–182; U.S. 2,891,855, Col. 3, line 66 through Col. 5, line 17 and Examples 1–4; Klingman, *Weed*

Control as a Science, John Wiley and Sons, Inc., New York, 1961, pp 81–96; Hance et al., *Weed Control Handbook*, 8th Ed., Blackwell Scientific Publications, Oxford, 1989; and *Developments in formulation technology*, PJB Publications, Richmond, UK, 2000.

In the following Examples, all percentages are by weight and all formulations are prepared in conventional ways. Compound numbers refer to compounds in Index Table A. Without further elaboration, it is believed that one skilled in the art using the preceding description can utilize the present invention to its fullest extent. The following Examples are, therefore, to be construed as merely illustrative, and not limiting of the disclosure in any way whatsoever. Percentages are by weight except where otherwise indicated.

Example A

High Strength Concentrate

Compound 1	98.5%
silica aerogel	0.5%
synthetic amorphous fine silica	1.0%

Example B

Wettable Powder

Compound 1	65.0%
dodecylphenol polyethylene glycol ether	2.0%
sodium ligninsulfonate	4.0%
sodium silicoaluminate	6.0%
montmorillonite (calcined)	23.0%

Example C

Granule

Compound 1	10.0%
attapulgite granules (low volatile matter, 0.71/0.30 mm; U.S.S. No. 25–50 sieves)	90.0%

Example D

Extruded Pellet

Compound 1	25.0%
anhydrous sodium sulfate	10.0%
crude calcium ligninsulfonate	5.0%
sodium alkyl naphthalenesulfonate	1.0%
calcium/magnesium bentonite	59.0%

Example E

Emulsifiable Concentrate

Compound 1	10.0%
polyoxyethylene sorbitol hexoleate	20.0%
C ₆ –C ₁₀ fatty acid methyl ester	70.0%

Example FMicroemulsion

Compound 1	5.0%
polyvinylpyrrolidone-vinyl acetate copolymer	30.0%
alkylpolyglycoside	30.0%
glyceryl monooleate	15.0%
water	20.0%

Example GSuspension Concentrate

Compound 1	35%
butyl polyoxyethylene/polypropylene block copolymer	4.0%
stearic acid/polyethylene glycol copolymer	1.0%
styrene acrylic polymer	1.0%
xanthan gum	0.1%
propylene glycol	5.0%
silicone based defoamer	0.1%
1,2-benzisothiazolin-3-one	0.1%
water	53.7%

Example HEmulsion in Water

Compound 1	10.0%
butyl polyoxyethylene/polypropylene block copolymer	4.0%
stearic acid/polyethylene glycol copolymer	1.0%
styrene acrylic polymer	1.0%
xanthan gum	0.1%
propylene glycol	5.0%
silicone based defoamer	0.1%
1,2-benzisothiazolin-3-one	0.1%
aromatic petroleum based hydrocarbon	20.0
water	58.7%

Example IOil Dispersion

Compound 1	25%
polyoxyethylene sorbitol hexaoleate	15%
organically modified bentonite clay	2.5%
fatty acid methyl ester	57.5%

The present disclosure also includes Examples A through I above except “Compound 1” is replaced with “Compound 2” and “Compound 3”. “Compound 4”, “Compound 5”, “Compound 6”, “Compound 7” or “Compound 8” above as described in Index Table A. Test results indicate that the compounds of the present invention are highly active preemergent and/or postemergent herbicides and/or plant growth regulants. The compounds of the invention generally show highest activity for postemergence weed control (i.e. applied after weed seedlings emerge from the soil) and preemergence weed control (i.e. applied before weed seedlings emerge from the soil). Many of them have utility for broad-spectrum pre- and/or postemergence weed control in areas where complete control of all vegetation is desired such as around fuel storage tanks, industrial storage areas, parking lots, drive-in theaters, air fields, river banks, irrigation and other waterways, around billboards and highway and railroad structures. Many of the compounds of this invention, by virtue of selective metabolism in crops versus weeds, or by selective activity at the locus of physiological inhibition in crops and weeds, or by selective placement on or within the environment of a mixture of crops and weeds, are useful for the selective control of grass and broadleaf weeds within a crop/weed mixture. One skilled in the art will recognize that the preferred combination of these selectivity factors within a compound or group of compounds can readily be determined by performing routine biological and/or biochemical assays. Compounds of this invention may show tolerance to important agronomic crops including, but is not limited to, alfalfa, barley, cotton, wheat, rape, sugar beets, corn (maize), sorghum, soybeans, rice, oats, peanuts, vegetables, tomato, potato, perennial plantation crops including coffee, cocoa, oil palm, rubber, sugarcane, citrus, grapes, fruit trees, nut trees, banana, plantain, pineapple, hops, tea and forests such as eucalyptus and conifers (e.g., loblolly pine), and turf species (e.g., Kentucky bluegrass, St. Augustine grass, Kentucky fescue and Bermuda grass). Compounds of this invention can be used in crops genetically transformed or bred to incorporate resistance to herbicides, express proteins toxic to invertebrate pests (such as *Bacillus thuringiensis* toxin), and/or express other useful traits. Those skilled in the art will appreciate that not all compounds are equally effective against all weeds. Alternatively, the subject compounds are useful to modify plant growth.

As the compounds of the invention have both preemergent and postemergent herbicidal activity, to control undesired vegetation by killing or injuring the vegetation or reducing its growth, the compounds can be usefully applied by a variety of methods involving contacting a herbicidally effective amount of a compound of the invention, or a composition comprising said compound and at least one of a surfactant, a solid diluent or a liquid diluent, to the foliage or other part of the undesired vegetation or to the environment of the undesired vegetation such as the soil or water in which the undesired vegetation is growing or which surrounds the seed or other propagule of the undesired vegetation. Undesired vegetation includes at least one selected from the group consisting of grass weeds

and broadleaf weeds. Undesired vegetation is selected from the group consisting of annual bluegrass (*Poa annua*), Benghal dayflower, blackgrass (*Alopecurus myosuroides*), black nightshade (eastern black nightshade, *Solanum ptycanthum*), broadleaf signalgrass, Canada thistle, cheat, common cocklebur (*Xanthium pensylvanicum* or *Xanthium strumarium*), corn

5 poppies, field violet (*Viola arvensis*), goosegrass (*Eleusine indica*), guinea grass, hairy beggarticks (*Bidens pilosa*), herbicide-resistant blackgrass, horseweed, Italian rye grass, jimsonweed, Johnson grass (*Sorghum halepense*), large crabgrass (*Digitaria sanguinalis*), little seed canary grass, morning glory, Pennsylvania smartweed, ladysthumb smartweed (*Polygonum Persicaria*), pitted morning glory, prickly sida, quackgrass, redroot pigweed,

10 palmer pigweed (*Amaranthus palmeri*), shattercane, shepherd's purse, windgrass, silky windgrass (*Apera spica-venti*), sunflower (*Helianthus annuus*, as a weed in a potato crop), wild buckwheat (*Polygonum convolvulus*), wild mustard (*Sinapis arvensis*), wild oat (*Avena fatua*), wild pointsettia, yellow foxtail, yellow nutsedge (*Cyperus esculentus*), johnsongrass (*Sorghum halepense*), lambsquarters (*Chenopodium album*), morningglory (*Ipomoea*

15 *coccinea*), common waterhemp (*Amaranthus rudis*), surinam grass (*Brachiaria decumbens*), downy brome grass (*Bromus tectorum*), woolly cupgrass (*Eriochloa villosa*), bermudagrass (*Cynodon dactylon*), Russian thistle (*Salsola kali*), velvetleaf (*Abutilon theophrasti*), common chickweed (*Stellaria media*), henbit deadnettle (*Lamium amplexicaule*), littleseed canarygrass (*Phalaris minor*), field poppy (*Papaver rhoeas*), scentless chamomile (*Matricaria*

20 *inodora*), bird's-eye speedwell (*Veronica persica*), wild radish (*Raphanus raphanistrum*), wild poinsettia (*Euphorbia heterophylla*), Brazilian crabgrass (*Digitaria horizontalis*), fall panicum (*Panicum dichotomiflorum*), southern sandbur (*Cenchrus echinatus*), arrowleaf sida (*Sida rhombifolia*), Virginia dayflower (*Commelina virginica*), field bindweed (*Convolvulus arvensis*), monochoria (*Monochoria vaginalis*), hardstem bulrush (*Scirpus juncoides*), purple

25 redstem (*Ammannia coccinea*), bearded sprangletop (*Leptochloa fascicularis*), common waterplantain (*Alisma plantago-aquatica*), and late watergrass (*Echinochloa oryzicola*).

A herbicidally effective amount of the compounds of this invention is determined by a number of factors. These factors include: formulation selected, method of application, amount and type of vegetation present, growing conditions, etc. In general, a herbicidally

30 effective amount of compounds of this invention is about 0.001 to 20 kg/ha with a preferred range of about 0.004 to 1 kg/ha. One skilled in the art can easily determine the herbicidally effective amount necessary for the desired level of weed control.

In one common embodiment, a compound of the invention is applied, typically in a formulated composition, to a locus comprising desired vegetation (e.g., crops) and undesired

35 vegetation (i.e. weeds), both of which may be seeds, seedlings and/or larger plants, in contact with a growth medium (e.g., soil). In this locus, a composition comprising a compound of the invention can be directly applied to a plant or a part thereof, particularly of the undesired vegetation, and/or to the growth medium in contact with the plant.

Plant varieties and cultivars of the desired vegetation in the locus treated with a compound of the invention can be obtained by conventional propagation and breeding methods or by genetic engineering methods. Genetically modified plants (transgenic plants) are those in which a heterologous gene (transgene) has been stably integrated into the plant's genome. A transgene that is defined by its particular location in the plant genome is called a transformation or transgenic event.

Although most typically, compounds of the invention are used to control undesired vegetation, contact of desired vegetation in the treated locus with compounds of the invention may result in super-additive or synergistic (enhanced) effects with genetic traits in the desired vegetation, including traits incorporated through genetic modification. For example, resistance to phytophagous insect pests or plant diseases, tolerance to biotic/abiotic stresses or storage stability may be greater than expected from the genetic traits in the desired vegetation.

Compounds of this invention can also be mixed with one or more other biologically active compounds or agents including herbicides, herbicide safeners, fungicides, insecticides, nematocides, bactericides, acaricides, growth regulators such as insect molting inhibitors and rooting stimulants, chemosterilants, semiochemicals, repellents, attractants, pheromones, feeding stimulants, plant nutrients, other biologically active compounds or entomopathogenic bacteria, virus or fungi to form a multi-component pesticide giving an even broader spectrum of agricultural protection. Mixtures of the compounds of the invention with other herbicides can broaden the spectrum of activity against additional weed species, and suppress the proliferation of any resistant biotypes. Thus the present invention also pertains to a composition comprising a compound of Formula 1 (in a herbicidally effective amount) and at least one additional biologically active compound or agent (in a biologically effective amount) and can further comprise at least one of a surfactant, a solid diluent or a liquid diluent. The other biologically active compounds or agents can be formulated in compositions comprising at least one of a surfactant, solid or liquid diluent. For mixtures of the present invention, one or more other biologically active compounds or agents can be formulated together with a compound of Formula 1, to form a premix, or one or more other biologically active compounds or agents can be formulated separately from the compound of Formula 1, and the formulations combined together before application (e.g., in a spray tank) or, alternatively, applied in succession.

A mixture of one or more of the following herbicides with a compound of this invention may be particularly useful for weed control: acetochlor, acifluorfen and its sodium salt, aclonifen, acrolein (2-propenal), alachlor, alloxidim, ametryn, amicarbazone, amidosulfuron, aminocyclopyrachlor and its esters (e.g., methyl, ethyl) and salts (e.g., sodium, potassium), aminopyralid, amitrole, ammonium sulfamate, anilofos, asulam, atrazine, azimsulfuron, beflubutamid, *S*-beflubutamide, benazolin, benazolin-ethyl,

bencarbazone, benfluralin, benfuresate, bensulfuron-methyl, bensulide, bentazone, benzobicyclon, benzofenap, bicyclopyrone, bifenox, bilanafos, bispyribac and its sodium salt, bromacil, bromobutide, bromofenoxim, bromoxynil, bromoxynil octanoate, butachlor, butafenacil, butamifos, butralin, butroxydim, butylate, cafenstrole, carbetamide, 5 carfentrazone-ethyl, catechin, chlomethoxyfen, chloramben, chlorbromuron, chlorflurenol-methyl, chloridazon, chlorimuron-ethyl, chlorotoluron, chlorpropham, chlorsulfuron, chlorthal-dimethyl, chlorthiamid, cinidon-ethyl, cinmethylin, cinosulfuron, clacyfos, clefoxydim, clethodim, clodinafop-propargyl, clomazone, clomeprop, clopyralid, clopyralid-olamine, cloransulam-methyl, cumyluron, cyanazine, cycloate, cyclopyranil, 10 cyclopyrimorate, cyclosulfamuron, cycloxydim, cyhalofop-butyl, 2,4-D and its butotyl, butyl, isooctyl and isopropyl esters and its dimethylammonium, diolamine and trolamine salts, daimuron, dalapon, dalapon-sodium, dazomet, 2,4-DB and its dimethylammonium, potassium and sodium salts, desmedipham, desmetryn, dicamba and its diglycolammonium, dimethylammonium, potassium and sodium salts, dichlobenil, dichlorprop, diclofop-methyl, 15 diclosulam, difenzoquat metilsulfate, diflufenican, diflufenzopyr, dimefuron, dimepiperate, dimethachlor, dimethametryn, dimethenamid, dimethenamid-P, dimethipin, dimethylarsinic acid and its sodium salt, dinitramine, dinoterb, diphenamid, diquat dibromide, dithiopyr, diuron, DNOC, endothal, EPTC, esprocarb, ethalfluralin, ethametsulfuron-methyl, ethiozin, ethofumesate, ethoxyfen, ethoxysulfuron, etobenzanid, fenoxaprop-ethyl, fenoxaprop-P-ethyl, 20 fenoxasulfone, fenquinotrione, fentrazamide, fenuron, fenuron-TCA, flamprop-methyl, flamprop-M-isopropyl, flamprop-M-methyl, flazasulfuron, florasulam, fluazifop-butyl, fluazifop-P-butyl, fluazolate, flucarbazone, flucetosulfuron, fluchloralin, flufenacet, flufenpyr, flufenpyr-ethyl, flumetsulam, flumiclorac-pentyl, flumioxazin, fluometuron, fluoroglycofen-ethyl, flupoxam, flupyrsulfuron-methyl and its sodium salt, 25 flurenol, flurenol-butyl, fluridone, flurochloridone, fluroxypyr, flurtamone, fluthiacet-methyl, fomesafen, foramsulfuron, fosamine-ammonium, glufosinate, glufosinate-ammonium, glufosinate-P, glyphosate and its salts such as ammonium, isopropylammonium, potassium, sodium (including sesquisodium) and trimesium (alternatively named sulfosate), halauxifen, halauxifen-methyl, halosulfuron-methyl, 30 haloxyfop-etotyl, haloxyfop-methyl, hexazinone, hydantocidin, imazamethabenz-methyl, imazamox, imazapic, imazapyr, imazaquin, imazaquin-ammonium, imazethapyr, imazethapyr-ammonium, imazosulfuron, indanofan, indaziflam, iofensulfuron, iodosulfuron-methyl, ioxynil, ioxynil octanoate, ioxynil-sodium, ipfencarbazone, isoproturon, isouron, isoxaben, isoxaflutole, isoxachlortole, lactofen, lenacil, linuron, maleic hydrazide, MCPA and its salts (e.g., MCPA-dimethylammonium, MCPA-potassium and MCPA-sodium, esters (e.g., MCPA-2-ethylhexyl, MCPA-butotyl) and thioesters (e.g., MCPA-thioethyl), MCPB and its salts (e.g., MCPB-sodium) and esters (e.g., MCPB-ethyl), mecoprop, mecoprop-P, mefenacet, mefluidide, mesosulfuron-methyl, mesotrione, metam-sodium, metamifop,

metamitron, metazachlor, metazosulfuron, methabenzthiazuron, methylarsonic acid and its calcium, monoammonium, monosodium and disodium salts, methylaldymron, metobenzuron, metobromuron, metolachlor, S-metolachlor, metosulam, metoxuron, metribuzin, metsulfuron-methyl, molinate, monolinuron, naproanilide, napropamide, napropamide-M, naptalam, neburon, nicosulfuron, norflurazon, orbencarb, orthosulfamuron, oryzalin, oxadiargyl, oxadiazon, oxasulfuron, oxaziclomefone, oxyfluorfen, paraquat dichloride, pebulate, pelargonic acid, pendimethalin, penoxsulam, pentanochlor, pentoxazone, perfluidone, pethoxamid, pethoxyamid, phenmedipham, picloram, picloram-potassium, picolinafen, pinoxaden, piperophos, pretilachlor, primisulfuron-methyl, prodiamine, profoxydim, prometon, prometryn, propachlor, propanil, propaquizafop, propazine, propham, propisochlor, propoxycarbazone, propyrisulfuron, propyzamide, prosulfocarb, prosulfuron, pyraclonil, pyraflufen-ethyl, pyrasulfotole, pyrazogyl, pyrazolynate, pyrazoxyfen, pyrazosulfuron-ethyl, pyribenzoxim, pyributicarb, pyridate, pyriftalid, pyriminobac-methyl, pyrimisulfan, pyriothiobac, pyriothiobac-sodium, pyroxasulfone, pyroxsulam, quinclorac, quinmerac, quincloramine, quizalofop-ethyl, quizalofop-P-ethyl, quizalofop-P-tefuryl, rimsulfuron, saflufenacil, sethoxydim, siduron, simazine, simetryn, sulcotrione, sulfentrazone, sulfometuron-methyl, sulfosulfuron, 2,3,6-TBA, TCA, TCA-sodium, tebutam, tebuthiuron, tefuryltrione, tembotrione, tepraloxym, terbacil, terbumeton, terbuthylazine, terbutryn, thenylchlor, thiazopyr, thiencarbazone, thifensulfuron-methyl, thiobencarb, tiafenacil, tiocarbamil, tolpyralate, topramezone, tralkoxydim, tri-allate, triafamone, triasulfuron, triaziflam, tribenuron-methyl, triclopyr, triclopyr-butotyl, triclopyr-triethylammonium, tridiphane, trietazine, trifloxysulfuron, trifludimoxazin, trifluralin, triflusulfuron-methyl, tritosulfuron, vernolate, 3-(2-chloro-3,6-difluorophenyl)-4-hydroxy-1-methyl-1,5-naphthyridin-2(1H)-one, 5-chloro-3-[(2-hydroxy-6-oxo-1-cyclohexen-1-yl)carbonyl]-1-(4-methoxyphenyl)-2(1H)-quinoxalinone, 2-chloro-N-(1-methyl-1H-tetrazol-5-yl)-6-(trifluoromethyl)-3-pyridinecarboxamide, 7-(3,5-dichloro-4-pyridinyl)-5-(2,2-difluoroethyl)-8-hydroxypyrido[2,3-b]pyrazin-6(5H)-one, 4-(2,6-diethyl-4-methylphenyl)-5-hydroxy-2,6-dimethyl-3(2H)-pyridazinone, 5-[(2,6-difluorophenyl)methoxy]methyl]-4,5-dihydro-5-methyl-3-(3-methyl-2-thienyl)isoxazole (previously methioxolin), 4-(4-fluorophenyl)-6-[(2-hydroxy-6-oxo-1-cyclohexen-1-yl)carbonyl]-2-methyl-1,2,4-triazine-3,5(2H,4H)-dione, methyl 4-amino-3-chloro-6-(4-chloro-2-fluoro-3-methoxyphenyl)-5-fluoro-2-pyridinecarboxylate, 2-methyl-3-(methylsulfonyl)-N-(1-methyl-1H-tetrazol-5-yl)-4-(trifluoromethyl)benzamide and 2-methyl-N-(4-methyl-1,2,5-oxadiazol-3-yl)-3-(methylsulfinyl)-4-(trifluoromethyl)benzamide. Other herbicides also include bioherbicides such as *Alternaria destruens* Simmons, *Colletotrichum gloeosporioides* (Penz.) Penz. & Sacc., *Drechslera monoceras* (MTB-951), *Myrothecium verrucaria* (Albertini & Schweinitz) Ditmar: Fries, *Phytophthora palmivora* (Butl.) Butl. and *Puccinia thlaspeos* Schub.

Preferred for better control of undesired vegetation (e.g., lower use rate such as from greater-than-additive effects, broader spectrum of weeds controlled, or enhanced crop safety) or for preventing the development of resistant weeds are mixtures of a compound of this invention with a herbicide selected from the group consisting of atrazine, azimsulfuron, beflubutamid, *S*-beflubutamide, benzisothiazolinone, carfentrazone-ethyl, chlorimuron-ethyl, 5 chlorsulfuron-methyl, clomazone, clopyralid potassium, cloransulam-methyl, 2-[(2,5-dichlorophenyl)methyl]-4,4-dimethyl-3-isoxazolidinone, ethametsulfuron-methyl, flumetsulam, 4-(4-fluorophenyl)-6-[(2-hydroxy-6-oxo-1-cyclohexen-1-yl)carbonyl]-2-methyl-1,2,4-triazine-3,5-(*2H,4H*)-dione, flupyrsulfuron-methyl, fluthiacet-methyl, 10 fomesafen, imazethapyr, lenacil, mesotrione, metribuzin, metsulfuron-methyl, pethoxamid, picloram, pyroxasulfone, quinclorac, rimsulfuron, *S*-metolachlor, sulfentrazone, thifensulfuron-methyl, triflurosulfuron-methyl and tribenuron-methyl.

Compounds of this invention can also be used in combination with plant growth regulators such as aviglycine, *N*-(phenylmethyl)-1*H*-purin-6-amine, epocholeone, gibberellic 15 acid, gibberellin A₄ and A₇, harpin protein, mepiquat chloride, prohexadione calcium, prohydrojasmon, sodium nitrophenolate and trinexapac-methyl, and plant growth modifying organisms such as *Bacillus cereus* strain BP01.

General references for agricultural protectants (i.e. herbicides, herbicide safeners, insecticides, fungicides, nematocides, acaricides and biological agents) include *The Pesticide* 20 *Manual, 13th Edition*, C. D. S. Tomlin, Ed., British Crop Protection Council, Farnham, Surrey, U.K., 2003 and *The BioPesticide Manual, 2nd Edition*, L. G. Copping, Ed., British Crop Protection Council, Farnham, Surrey, U.K., 2001.

For embodiments where one or more of these various mixing partners are used, the mixing partners are typically used in the amounts similar to amounts customary when the mixture partners are used alone. More particularly in mixtures, active ingredients are often 25 applied at an application rate between one-half and the full application rate specified on product labels for use of active ingredient alone. These amounts are listed in references such as *The Pesticide Manual* and *The BioPesticide Manual*. The weight ratio of these various mixing partners (in total) to the compound of Formula 1 is typically between about 1:3000 and about 3000:1. Of note are weight ratios between about 1:300 and about 300:1 (for 30 example ratios between about 1:30 and about 30:1). One skilled in the art can easily determine through simple experimentation the biologically effective amounts of active ingredients necessary for the desired spectrum of biological activity. It will be evident that including these additional components may expand the spectrum of weeds controlled beyond 35 the spectrum controlled by the compound of Formula 1 alone.

In certain instances, combinations of a compound of this invention with other biologically active (particularly herbicidal) compounds or agents (i.e. active ingredients) can result in a greater-than-additive (i.e. synergistic or (enhanced)) effect on weeds and/or a less-

than-additive effect (i.e. safening) on crops or other desirable plants. Reducing the quantity of active ingredients released in the environment while ensuring effective pest control is always desirable. Ability to use greater amounts of active ingredients to provide more effective weed control without excessive crop injury is also desirable. When synergism (enhancement) of herbicidal active ingredients occurs on weeds at application rates giving agronomically satisfactory levels of weed control, such combinations can be advantageous for reducing crop production cost and decreasing environmental load. When safening of herbicidal active ingredients occurs on crops, such combinations can be advantageous for increasing crop protection by reducing weed competition.

Of note is a combination of a compound of the invention with at least one other herbicidal active ingredient. Of particular note is such a combination where the other herbicidal active ingredient has different site of action from the compound of the invention. In certain instances, a combination with at least one other herbicidal active ingredient having a similar spectrum of control but a different site of action will be particularly advantageous for resistance management. Thus, a composition of the present invention can further comprise (in a herbicidally effective amount) at least one additional herbicidal active ingredient having a similar spectrum of control but a different site of action.

Compounds of this invention can also be used in combination with herbicide safeners such as allidochlor, benoxacor, cloquintocet-mexyl, cumyluron, cyometrinil, cyprosulfonamide, daimuron, dichlormid, dicyclonon, dietholate, dimepiperate, fenchlorazole-ethyl, fencloirim, flurazole, fluxofenim, furilazole, isoxadifen-ethyl, mefenpyr-diethyl, mephenate, methoxyphenone naphthalic anhydride (1,8-naphthalic anhydride), oxabetrinil, *N*-(aminocarbonyl)-2-methylbenzenesulfonamide, *N*-(aminocarbonyl)-2-fluorobenzenesulfonamide, 1-bromo-4-[(chloromethyl)sulfonyl]benzene (BCS), 4-(dichloroacetyl)-1-oxa-4-azospiro[4.5]decane (MON 4660), 2-(dichloromethyl)-2-methyl-1,3-dioxolane (MG 191), ethyl 1,6-dihydro-1-(2-methoxyphenyl)-6-oxo-2-phenyl-5-pyrimidinecarboxylate, 2-hydroxy-*N,N*-dimethyl-6-(trifluoromethyl)pyridine-3-carboxamide, and 3-oxo-1-cyclohexen-1-yl 1-(3,4-dimethylphenyl)-1,6-dihydro-6-oxo-2-phenyl-5-pyrimidinecarboxylate, 2,2-dichloro-1-(2,2,5-trimethyl-3-oxazolidinyl)-ethanone and 2-methoxy-*N*-[[4-[(methylamino)carbonyl]amino]phenyl]sulfonyl]-benzamide to increase safety to certain crops. Antidotally effective amounts of the herbicide safeners can be applied at the same time as the compounds of this invention, or applied as seed treatments. Therefore an aspect of the present invention relates to a herbicidal mixture comprising a compound of this invention and an antidotally effective amount of a herbicide safener. Seed treatment is particularly useful for selective weed control, because it physically restricts antidoting to the crop plants. Therefore a particularly useful embodiment of the present invention is a method for selectively controlling the growth of undesired vegetation in a crop comprising contacting the locus of the crop with a herbicidally effective

amount of a compound of this invention wherein seed from which the crop is grown is treated with an antidotally effective amount of safener. Antidotally effective amounts of safeners can be easily determined by one skilled in the art through simple experimentation.

Compounds of the invention can also be mixed with: (1) polynucleotides including but not limited to DNA, RNA, and/or chemically modified nucleotides influencing the amount of a particular target through down regulation, interference, suppression or silencing of the genetically derived transcript that render a herbicidal effect; or (2) polynucleotides including but not limited to DNA, RNA, and/or chemically modified nucleotides influencing the amount of a particular target through down regulation, interference, suppression or silencing of the genetically derived transcript that render a safening effect.

Of note is a composition comprising a compound of the invention (in a herbicidally effective amount), at least one additional active ingredient selected from the group consisting of other herbicides and herbicide safeners (in an effective amount), and at least one component selected from the group consisting of surfactants, solid diluents and liquid diluents. Table A1 lists specific combinations of a Component (a) with Component (b) illustrative of the mixtures, compositions and methods of the present invention. Compound 1 in the Component (a) column is identified in Index Table A. The second column of Table A1 lists the specific Component (b) compound (e.g., "2,4-D" in the first line). The third, fourth and fifth columns of Table A1 lists ranges of weight ratios for rates at which the Component (a) compound is typically applied to a field-grown crop relative to Component (b) (i.e. (a):(b)). Thus, for example, the first line of Table A1 specifically discloses the combination of Component (a) (i.e. Compound 1 in Index Table A) with 2,4-D is typically applied in a weight ratio between 1:192 – 6:1. The remaining lines of Table A1 are to be construed similarly.

TABLE A1

<u>Component (a)</u> <u>(Compound #)</u>	<u>Component (b)</u>	<u>Typical</u> <u>Weight Ratio</u>	<u>More Typical</u> <u>Weight Ratio</u>	<u>Most Typical</u> <u>Weight Ratio</u>
1	2,4-D	1:192 – 6:1	1:64 – 2:1	1:24 – 1:3
1	Acetochlor	1:768 – 2:1	1:256 – 1:2	1:96 – 1:11
1	Acifluorfen	1:96 – 12:1	1:32 – 4:1	1:12 – 1:2
1	Aclonifen	1:857 – 2:1	1:285 – 1:3	1:107 – 1:12
1	Alachlor	1:768 – 2:1	1:256 – 1:2	1:96 – 1:11
1	Ametryn	1:384 – 3:1	1:128 – 1:1	1:48 – 1:6
1	Amicarbazone	1:192 – 6:1	1:64 – 2:1	1:24 – 1:3
1	Amidosulfuron	1:6 – 168:1	1:2 – 56:1	1:1 – 11:1
1	Aminocyclopyrachlor	1:48 – 24:1	1:16 – 8:1	1:6 – 2:1
1	Aminopyralid	1:20 – 56:1	1:6 – 19:1	1:2 – 4:1

<u>Component (a)</u> <u>(Compound #)</u>	<u>Component (b)</u>	<u>Typical</u> <u>Weight Ratio</u>	<u>More Typical</u> <u>Weight Ratio</u>	<u>Most Typical</u> <u>Weight Ratio</u>
1	Amitrole	1:768 – 2:1	1:256 – 1:2	1:96 – 1:11
1	Anilofos	1:96 – 12:1	1:32 – 4:1	1:12 – 1:2
1	Asulam	1:960 – 2:1	1:320 – 1:3	1:120 – 1:14
1	Atrazine	1:192 – 6:1	1:64 – 2:1	1:24 – 1:3
1	Azimsulfuron	1:6 – 168:1	1:2 – 56:1	1:1 – 11:1
1	Beflubutamid	1:342 – 4:1	1:114 – 2:1	1:42 – 1:5
1	S-Beflubutamid	1:171 – 4:0.5	1:57 – 2:0.5	1:21 – 1:2.5
1	Benfuresate	1:617 – 2:1	1:205 – 1:2	1:77 – 1:9
1	Bensulfuron-methyl	1:25 – 45:1	1:8 – 15:1	1:3 – 3:1
1	Bentazone	1:192 – 6:1	1:64 – 2:1	1:24 – 1:3
1	Benzobicyclon	1:85 – 14:1	1:28 – 5:1	1:10 – 1:2
1	Benzofenap	1:257 – 5:1	1:85 – 2:1	1:32 – 1:4
1	Bicyclopyrone	1:42 – 27:1	1:14 – 9:1	1:5 – 2:1
1	Bifenox	1:257 – 5:1	1:85 – 2:1	1:32 – 1:4
1	Bispyribac-sodium	1:10 – 112:1	1:3 – 38:1	1:1 – 7:1
1	Bromacil	1:384 – 3:1	1:128 – 1:1	1:48 – 1:6
1	Bromobutide	1:384 – 3:1	1:128 – 1:1	1:48 – 1:6
1	Bromoxynil	1:96 – 12:1	1:32 – 4:1	1:12 – 1:2
1	Butachlor	1:768 – 2:1	1:256 – 1:2	1:96 – 1:11
1	Butafenacil	1:42 – 27:1	1:14 – 9:1	1:5 – 2:1
1	Butylate	1:1542 – 1:2	1:514 – 1:5	1:192 – 1:22
1	Carfenstrole	1:192 – 6:1	1:64 – 2:1	1:24 – 1:3
1	Carfentrazone-ethyl	1:128 – 9:1	1:42 – 3:1	1:16 – 1:2
1	Chlorimuron-ethyl	1:8 – 135:1	1:2 – 45:1	1:1 – 9:1
1	Chlorotoluron	1:768 – 2:1	1:256 – 1:2	1:96 – 1:11
1	Chlorsulfuron	1:6 – 168:1	1:2 – 56:1	1:1 – 11:1
1	Cincosulfuron	1:17 – 68:1	1:5 – 23:1	1:2 – 5:1
1	Cinidon-ethyl	1:384 – 3:1	1:128 – 1:1	1:48 – 1:6
1	Cinmethylin	1:34 – 34:1	1:11 – 12:1	1:4 – 3:1
1	Clacyfos	1:34 – 34:1	1:11 – 12:1	1:4 – 3:1
1	Clethodim	1:48 – 24:1	1:16 – 8:1	1:6 – 2:1
1	Clodinafop-propargyl	1:20 – 56:1	1:6 – 19:1	1:2 – 4:1
1	Clomazone	1:384 – 3:1	1:128 – 1:1	1:48 – 1:6
1	Clomeprop	1:171 – 7:1	1:57 – 3:1	1:21 – 1:3
1	Clopyralid	1:192 – 6:1	1:64 – 2:1	1:24 – 1:3

<u>Component (a)</u> <u>(Compound #)</u>	<u>Component (b)</u>	<u>Typical</u> <u>Weight Ratio</u>	<u>More Typical</u> <u>Weight Ratio</u>	<u>Most Typical</u> <u>Weight Ratio</u>
1	Cloransulam-methyl	1:12 – 96:1	1:4 – 32:1	1:1 – 6:1
1	Cumyluron	1:384 – 3:1	1:128 – 1:1	1:48 – 1:6
1	Cyanazine	1:384 – 3:1	1:128 – 1:1	1:48 – 1:6
1	Cyclopyrimorate	1:17 – 68:1	1:5 – 23:1	1:2 – 5:1
1	Cyclosulfamuron	1:17 – 68:1	1:5 – 23:1	1:2 – 5:1
1	Cycloxydim	1:96 – 12:1	1:32 – 4:1	1:12 – 1:2
1	Cyhalofop	1:25 – 45:1	1:8 – 15:1	1:3 – 3:1
1	Daimuron	1:192 – 6:1	1:64 – 2:1	1:24 – 1:3
1	Desmedipham	1:322 – 4:1	1:107 – 2:1	1:40 – 1:5
1	Dicamba	1:192 – 6:1	1:64 – 2:1	1:24 – 1:3
1	Dichlobenil	1:1371 – 1:2	1:457 – 1:4	1:171 – 1:20
1	Dichlorprop	1:925 – 2:1	1:308 – 1:3	1:115 – 1:13
1	Diclofop-methyl	1:384 – 3:1	1:128 – 1:1	1:48 – 1:6
1	Diclosulam	1:10 – 112:1	1:3 – 38:1	1:1 – 7:1
1	Difenzoquat	1:288 – 4:1	1:96 – 2:1	1:36 – 1:4
1	Diflufenican	1:857 – 2:1	1:285 – 1:3	1:107 – 1:12
1	Diflufenzopyr	1:12 – 96:1	1:4 – 32:1	1:1 – 6:1
1	Dimethachlor	1:768 – 2:1	1:256 – 1:2	1:96 – 1:11
1	Dimethametryn	1:192 – 6:1	1:64 – 2:1	1:24 – 1:3
1	Dimethenamid-P	1:384 – 3:1	1:128 – 1:1	1:48 – 1:6
1	Dithiopyr	1:192 – 6:1	1:64 – 2:1	1:24 – 1:3
1	Diuron	1:384 – 3:1	1:128 – 1:1	1:48 – 1:6
1	EPTC	1:768 – 2:1	1:256 – 1:2	1:96 – 1:11
1	Esprocarb	1:1371 – 1:2	1:457 – 1:4	1:171 – 1:20
1	Ethalfuralin	1:384 – 3:1	1:128 – 1:1	1:48 – 1:6
1	Ethametsulfuron-methyl	1:17 – 68:1	1:5 – 23:1	1:2 – 5:1
1	Ethoxyfen	1:8 – 135:1	1:2 – 45:1	1:1 – 9:1
1	Ethoxysulfuron	1:20 – 56:1	1:6 – 19:1	1:2 – 4:1
1	Etobenzanid	1:257 – 5:1	1:85 – 2:1	1:32 – 1:4
1	Fenoxaprop-ethyl	1:120 – 10:1	1:40 – 4:1	1:15 – 1:2
1	Fenoxasulfone	1:85 – 14:1	1:28 – 5:1	1:10 – 1:2
1	Fenquinotriene	1:17 – 68:1	1:5 – 23:1	1:2 – 5:1
1	Fentrazamide	1:17 – 68:1	1:5 – 23:1	1:2 – 5:1
1	Flazasulfuron	1:17 – 68:1	1:5 – 23:1	1:2 – 5:1
1	Florasulam	1:2 – 420:1	1:1 – 140:1	2:1 – 27:1

<u>Component (a)</u> <u>(Compound #)</u>	<u>Component (b)</u>	<u>Typical</u> <u>Weight Ratio</u>	<u>More Typical</u> <u>Weight Ratio</u>	<u>Most Typical</u> <u>Weight Ratio</u>
1	Fluazifop-butyl	1:192 – 6:1	1:64 – 2:1	1:24 – 1:3
1	Flucarbazone	1:8 – 135:1	1:2 – 45:1	1:1 – 9:1
1	Flucetosulfuron	1:8 – 135:1	1:2 – 45:1	1:1 – 9:1
1	Flufenacet	1:257 – 5:1	1:85 – 2:1	1:32 – 1:4
1	Flumetsulam	1:24 – 48:1	1:8 – 16:1	1:3 – 3:1
1	Flumiclorac-pentyl	1:10 – 112:1	1:3 – 38:1	1:1 – 7:1
1	Flumioxazin	1:25 – 45:1	1:8 – 15:1	1:3 – 3:1
1	Fluometuron	1:384 – 3:1	1:128 – 1:1	1:48 – 1:6
1	Flupyr-sulfuron-methyl	1:3 – 336:1	1:1 – 112:1	2:1 – 21:1
1	Fluridone	1:384 – 3:1	1:128 – 1:1	1:48 – 1:6
1	Fluroxypyr	1:96 – 12:1	1:32 – 4:1	1:12 – 1:2
1	Flurtamone	1:857 – 2:1	1:285 – 1:3	1:107 – 1:12
1	Fluthiacet-methyl	1:48 – 42:1	1:16 – 14:1	1:3 – 3:1
1	Fomesafen	1:96 – 12:1	1:32 – 4:1	1:12 – 1:2
1	Foramsulfuron	1:13 – 84:1	1:4 – 28:1	1:1 – 6:1
1	Glufosinate	1:288 – 4:1	1:96 – 2:1	1:36 – 1:4
1	Glyphosate	1:288 – 4:1	1:96 – 2:1	1:36 – 1:4
1	Halosulfuron-methyl	1:17 – 68:1	1:5 – 23:1	1:2 – 5:1
1	Halauxifen	1:20 – 56:1	1:6 – 19:1	1:2 – 4:1
1	Halauxifen methyl	1:20 – 56:1	1:6 – 19:1	1:2 – 4:1
1	Haloxypyr-methyl	1:34 – 34:1	1:11 – 12:1	1:4 – 3:1
1	Hexazinone	1:192 – 6:1	1:64 – 2:1	1:24 – 1:3
1	Hydantocidin	1:1100 – 16:1	1:385 – 8:1	1:144 – 4:1
1	Imazamox	1:13 – 84:1	1:4 – 28:1	1:1 – 6:1
1	Imazapic	1:20 – 56:1	1:6 – 19:1	1:2 – 4:1
1	Imazapyr	1:85 – 14:1	1:28 – 5:1	1:10 – 1:2
1	Imazaquin	1:34 – 34:1	1:11 – 12:1	1:4 – 3:1
1	Imazethabenz-methyl	1:171 – 7:1	1:57 – 3:1	1:21 – 1:3
1	Imazethapyr	1:24 – 48:1	1:8 – 16:1	1:3 – 3:1
1	Imazosulfuron	1:27 – 42:1	1:9 – 14:1	1:3 – 3:1
1	Indanofan	1:342 – 4:1	1:114 – 2:1	1:42 – 1:5
1	Indaziflam	1:25 – 45:1	1:8 – 15:1	1:3 – 3:1
1	Iodosulfuron-methyl	1:3 – 336:1	1:1 – 112:1	2:1 – 21:1
1	Ioxynil	1:192 – 6:1	1:64 – 2:1	1:24 – 1:3
1	Ipfencarbazone	1:85 – 14:1	1:28 – 5:1	1:10 – 1:2

<u>Component (a)</u> <u>(Compound #)</u>	<u>Component (b)</u>	<u>Typical</u> <u>Weight Ratio</u>	<u>More Typical</u> <u>Weight Ratio</u>	<u>Most Typical</u> <u>Weight Ratio</u>
1	Isoproturon	1:384 – 3:1	1:128 – 1:1	1:48 – 1:6
1	Isoxaben	1:288 – 4:1	1:96 – 2:1	1:36 – 1:4
1	Isoxaflutole	1:60 – 20:1	1:20 – 7:1	1:7 – 2:1
1	Lactofen	1:42 – 27:1	1:14 – 9:1	1:5 – 2:1
1	Lenacil	1:384 – 3:1	1:128 – 1:1	1:48 – 1:6
1	Linuron	1:384 – 3:1	1:128 – 1:1	1:48 – 1:6
1	MCPA	1:192 – 6:1	1:64 – 2:1	1:24 – 1:3
1	MCPB	1:288 – 4:1	1:96 – 2:1	1:36 – 1:4
1	Mecoprop	1:768 – 2:1	1:256 – 1:2	1:96 – 1:11
1	Mefenacet	1:384 – 3:1	1:128 – 1:1	1:48 – 1:6
1	Mefluidide	1:192 – 6:1	1:64 – 2:1	1:24 – 1:3
1	Mesosulfuron-methyl	1:5 – 224:1	1:1 – 75:1	1:1 – 14:1
1	Mesotrione	1:42 – 27:1	1:14 – 9:1	1:5 – 2:1
1	Metamifop	1:42 – 27:1	1:14 – 9:1	1:5 – 2:1
1	Metazachlor	1:384 – 3:1	1:128 – 1:1	1:48 – 1:6
1	Metazosulfuron	1:25 – 45:1	1:8 – 15:1	1:3 – 3:1
1	Methabenzthiazuron	1:768 – 2:1	1:256 – 1:2	1:96 – 1:11
1	Metolachlor	1:768 – 2:1	1:256 – 1:2	1:96 – 1:11
1	Metosulam	1:8 – 135:1	1:2 – 45:1	1:1 – 9:1
1	Metribuzin	1:192 – 6:1	1:64 – 2:1	1:24 – 1:3
1	Metsulfuron-methyl	1:2 – 560:1	1:1 – 187:1	3:1 – 35:1
1	Molinate	1:1028 – 2:1	1:342 – 1:3	1:128 – 1:15
1	Napropamide	1:384 – 3:1	1:128 – 1:1	1:48 – 1:6
1	Napropamide-M	1:192 – 6:1	1:64 – 2:1	1:24 – 1:3
1	Naptalam	1:192 – 6:1	1:64 – 2:1	1:24 – 1:3
1	Nicosulfuron	1:12 – 96:1	1:4 – 32:1	1:1 – 6:1
1	Norflurazon	1:1152 – 1:1	1:384 – 1:3	1:144 – 1:16
1	Orbencarb	1:1371 – 1:2	1:457 – 1:4	1:171 – 1:20
1	Orthosulfamuron	1:20 – 56:1	1:6 – 19:1	1:2 – 4:1
1	Oryzalin	1:514 – 3:1	1:171 – 1:2	1:64 – 1:8
1	Oxadiargyl	1:384 – 3:1	1:128 – 1:1	1:48 – 1:6
1	Oxadiazon	1:548 – 3:1	1:182 – 1:2	1:68 – 1:8
1	Oxasulfuron	1:27 – 42:1	1:9 – 14:1	1:3 – 3:1
1	Oxaziclomefone	1:42 – 27:1	1:14 – 9:1	1:5 – 2:1
1	Oxyfluorfen	1:384 – 3:1	1:128 – 1:1	1:48 – 1:6

<u>Component (a)</u> <u>(Compound #)</u>	<u>Component (b)</u>	<u>Typical</u> <u>Weight Ratio</u>	<u>More Typical</u> <u>Weight Ratio</u>	<u>Most Typical</u> <u>Weight Ratio</u>
1	Paraquat	1:192 – 6:1	1:64 – 2:1	1:24 – 1:3
1	Pendimethalin	1:384 – 3:1	1:128 – 1:1	1:48 – 1:6
1	Penoxsulam	1:10 – 112:1	1:3 – 38:1	1:1 – 7:1
1	Pentoxamid	1:384 – 3:1	1:128 – 1:1	1:48 – 1:6
1	Pentoxazone	1:102 – 12:1	1:34 – 4:1	1:12 – 1:2
1	Phenmedipham	1:102 – 12:1	1:34 – 4:1	1:12 – 1:2
1	Picloram	1:96 – 12:1	1:32 – 4:1	1:12 – 1:2
1	Picolinafen	1:34 – 34:1	1:11 – 12:1	1:4 – 3:1
1	Pinoxaden	1:25 – 45:1	1:8 – 15:1	1:3 – 3:1
1	Pretilachlor	1:192 – 6:1	1:64 – 2:1	1:24 – 1:3
1	Primisulfuron-methyl	1:8 – 135:1	1:2 – 45:1	1:1 – 9:1
1	Prodiamine	1:384 – 3:1	1:128 – 1:1	1:48 – 1:6
1	Profoxydim	1:42 – 27:1	1:14 – 9:1	1:5 – 2:1
1	Prometryn	1:384 – 3:1	1:128 – 1:1	1:48 – 1:6
1	Propachlor	1:1152 – 1:1	1:384 – 1:3	1:144 – 1:16
1	Propanil	1:384 – 3:1	1:128 – 1:1	1:48 – 1:6
1	Propaquizafop	1:48 – 24:1	1:16 – 8:1	1:6 – 2:1
1	Propoxycarbazone	1:17 – 68:1	1:5 – 23:1	1:2 – 5:1
1	Propyrisulfuron	1:17 – 68:1	1:5 – 23:1	1:2 – 5:1
1	Propyzamide	1:384 – 3:1	1:128 – 1:1	1:48 – 1:6
1	Prosulfocarb	1:1200 – 1:2	1:400 – 1:4	1:150 – 1:17
1	Prosulfuron	1:6 – 168:1	1:2 – 56:1	1:1 – 11:1
1	Pyraclonil	1:42 – 27:1	1:14 – 9:1	1:5 – 2:1
1	Pyraflufen-ethyl	1:5 – 224:1	1:1 – 75:1	1:1 – 14:1
1	Pyrasulfotole	1:13 – 84:1	1:4 – 28:1	1:1 – 6:1
1	Pyrazolynate	1:857 – 2:1	1:285 – 1:3	1:107 – 1:12
1	Pyrazosulfuron-ethyl	1:10 – 112:1	1:3 – 38:1	1:1 – 7:1
1	Pyrazoxyfen	1:5 – 224:1	1:1 – 75:1	1:1 – 14:1
1	Pyribenzoxim	1:10 – 112:1	1:3 – 38:1	1:1 – 7:1
1	Pyributicarb	1:384 – 3:1	1:128 – 1:1	1:48 – 1:6
1	Pyridate	1:288 – 4:1	1:96 – 2:1	1:36 – 1:4
1	Pyriftalid	1:10 – 112:1	1:3 – 38:1	1:1 – 7:1
1	Pyriminobac-methyl	1:20 – 56:1	1:6 – 19:1	1:2 – 4:1
1	Pyrimisulfan	1:17 – 68:1	1:5 – 23:1	1:2 – 5:1
1	Pyriothiobac	1:24 – 48:1	1:8 – 16:1	1:3 – 3:1

<u>Component (a)</u> <u>(Compound #)</u>	<u>Component (b)</u>	<u>Typical</u> <u>Weight Ratio</u>	<u>More Typical</u> <u>Weight Ratio</u>	<u>Most Typical</u> <u>Weight Ratio</u>
1	Pyroxasulfone	1:85 – 14:1	1:28 – 5:1	1:10 – 1:2
1	Pyroxsulam	1:5 – 224:1	1:1 – 75:1	1:1 – 14:1
1	Quinclorac	1:192 – 6:1	1:64 – 2:1	1:24 – 1:3
1	Quizalofop-ethyl	1:42 – 27:1	1:14 – 9:1	1:5 – 2:1
1	Rimsulfuron	1:13 – 84:1	1:4 – 28:1	1:1 – 6:1
1	Saflufenacil	1:25 – 45:1	1:8 – 15:1	1:3 – 3:1
1	Sethoxydim	1:96 – 12:1	1:32 – 4:1	1:12 – 1:2
1	Simazine	1:384 – 3:1	1:128 – 1:1	1:48 – 1:6
1	Sulcotrione	1:120 – 10:1	1:40 – 4:1	1:15 – 1:2
1	Sulfentrazone	1:147 – 8:1	1:49 – 3:1	1:18 – 1:3
1	Sulfometuron-methyl	1:34 – 34:1	1:11 – 12:1	1:4 – 3:1
1	Sulfosulfuron	1:8 – 135:1	1:2 – 45:1	1:1 – 9:1
1	Tebuthiuron	1:384 – 3:1	1:128 – 1:1	1:48 – 1:6
1	Tefuryltrione	1:42 – 27:1	1:14 – 9:1	1:5 – 2:1
1	Tembotrione	1:31 – 37:1	1:10 – 13:1	1:3 – 3:1
1	Tepraloxydim	1:25 – 45:1	1:8 – 15:1	1:3 – 3:1
1	Terbacil	1:288 – 4:1	1:96 – 2:1	1:36 – 1:4
1	Terbuthylazine	1:857 – 2:1	1:285 – 1:3	1:107 – 1:12
1	Terbutryn	1:192 – 6:1	1:64 – 2:1	1:24 – 1:3
1	Thenylchlor	1:85 – 14:1	1:28 – 5:1	1:10 – 1:2
1	Thiazopyr	1:384 – 3:1	1:128 – 1:1	1:48 – 1:6
1	Thiencarbazone	1:3 – 336:1	1:1 – 112:1	2:1 – 21:1
1	Thifensulfuron-methyl	1:5 – 224:1	1:1 – 75:1	1:1 – 14:1
1	Tiafenacil	1:17 – 68:1	1:5 – 23:1	1:2 – 5:1
1	Thiobencarb	1:768 – 2:1	1:256 – 1:2	1:96 – 1:11
1	Tolpyralate	1:31 – 37:1	1:10 – 13:1	1:3 – 3:1
1	Topramzone	1:6 – 168:1	1:2 – 56:1	1:1 – 11:1
1	Tralkoxydim	1:68 – 17:1	1:22 – 6:1	1:8 – 2:1
1	Triafamone	1:2 – 420:1	1:1 – 140:1	2:1 – 27:1
1	Triallate	1:768 – 2:1	1:256 – 1:2	1:96 – 1:11
1	Triasulfuron	1:5 – 224:1	1:1 – 75:1	1:1 – 14:1
1	Triaziflam	1:171 – 7:1	1:57 – 3:1	1:21 – 1:3
1	Tribenuron-methyl	1:3 – 336:1	1:1 – 112:1	2:1 – 21:1
1	Triclopyr	1:192 – 6:1	1:64 – 2:1	1:24 – 1:3
1	Trifloxysulfuron	1:2 – 420:1	1:1 – 140:1	2:1 – 27:1

<u>Component (a)</u> <u>(Compound #)</u>	<u>Component (b)</u>	<u>Typical</u> <u>Weight Ratio</u>	<u>More Typical</u> <u>Weight Ratio</u>	<u>Most Typical</u> <u>Weight Ratio</u>
1	Trifludimoxazin	1:25 – 45:1	1:8 – 15:1	1:3 – 3:1
1	Trifluralin	1:288 – 4:1	1:96 – 2:1	1:36 – 1:4
1	Triflurosulfuron-methyl	1:17 – 68:1	1:5 – 23:1	1:2 – 5:1
1	Tritosulfuron	1:13 – 84:1	1:4 – 28:1	1:1 – 6:1

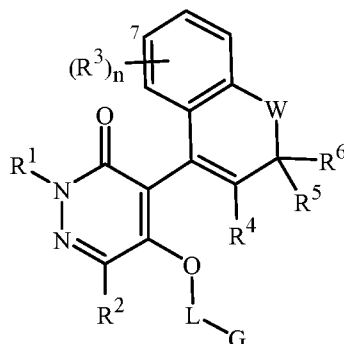
Table A2 is constructed the same as Table A1 above except that entries below the “Component (a)” column heading are replaced with the respective Component (a) Column Entry shown below. Compound 1 in the Component (a) column is identified in Index Table A. Thus, for example, in Table A2 the entries below the “Component (a)” column heading all recite “Compound 2” (i.e. Compound 2 identified in Index Table A), and the first line below the column headings in Table A2 specifically discloses a mixture of Compound 2 with 2,4-D. Tables A3 through A7 are constructed similarly.

<u>Table Number</u>	<u>Component (a) Column Entries</u>
A2	Compound 2
A3	Compound 3
A4	Compound 4
A5	Compound 5
A6	Compound 6
A7	Compound 7
A8	Compound 8

Preferred for better control of undesired vegetation (e.g., lower use rate such as from synergism (enhancement), broader spectrum of weeds controlled, or enhanced crop safety) or for preventing the development of resistant weeds are mixtures of a compound of this invention with a herbicide selected from the group consisting of chlorsulfuron, ethametsulfuron, chlorimuron-ethyl, mesotrione, thifensulfuron-methyl, flupyrsulfuron-methyl, tribenuron-methyl, metsulfuron-methyl, triflurosulfuron-methyl, pyrooxasulfone, pinoxaden, tembotrione, pyroxsulam, metolachlor and *S*-metolachlor.

The following Tests demonstrate the control efficacy of the compounds of this invention against specific weeds. The weed control afforded by the compounds is not limited, however, to these species. See Index Table A for compound descriptions. The abbreviation Me means methyl. The abbreviation “Cmpd. No.” stands for “Compound Number”. The abbreviation “Ex.” stands for “Example” and is followed by a number indicating in which example the compound is prepared. Mass spectra are reported with an estimated precision within ± 0.5 Da as the molecular weight of the highest isotopic abundance parent ion ($M+1$) formed by addition of H^+ (molecular weight of 1) to the molecule observed by using atmospheric pressure chemical ionization (AP+).

INDEX TABLE A



Cmpd. No.	R ¹	R ²	(R ³) _n	R ⁴	R ⁵ /R ⁶	W	L-G	Mass (AP ⁺)
1 (Ex. 1)	CH ₃	CH ₃	H	CH ₃	H/H	-CH ₂ -	CH ₃	297 *
2 (Ex. 2)	CH ₃	CH ₃	H	CH ₃	H/H	-CH ₂ -	H	283 *
3 (Ex. 3)	CH ₃	CH ₃	H	CH ₃	H/H	-O-	H	285 *
4	CH ₃	CH ₃	7-CH ₃	CH ₃	H/H	-CH ₂ -	H	297
5	CH ₃	CH ₃	H	CH ₃	H/H	-CH ₂ -	-C(=O)CH ₃	325
6	CH ₃	CH ₃	H	H	H/H	-C(CH ₃) ₂ -	CH ₃	311
7	CH ₃	CH ₃	H	H	H/H	-C(CH ₃) ₂ -	H	297
8	CH ₃	Cl	7-CH ₃	CH ₃	H/H	-CH ₂ -	H	**

* See Synthesis Example for ¹H NMR data.

** M.P. = 204–229 °C

5

BIOLOGICAL EXAMPLES OF THE INVENTION

TEST A

Seeds of plant species selected from barnyardgrass (*Echinochloa crus-galli*), kochia (*Kochia scoparia*), ragweed (common ragweed, *Ambrosia elatior*), ryegrass, It. (Italian ryegrass, *Lolium multiflorum*), foxtail, green (green foxtail, *Setaria viridis*), and pigweed (*Amaranthus retroflexus*) were planted into a blend of loam soil and sand and treated preemergence with a directed soil spray using test chemicals formulated in a non-phytotoxic solvent mixture which included a surfactant.

At the same time, plants selected from these weed species and also wheat (*Triticum aestivum*), corn (*Zea mays*), blackgrass (*Alopecurus myosuroides*), and galium (catchweed bedstraw, *Galium aparine*) were planted in pots containing the same blend of loam soil and sand and treated with postemergence applications of test chemicals formulated in the same manner. Plants ranged in height from 2 to 10 cm and were in the one- to two-leaf stage for the postemergence treatment. Treated plants and untreated controls were maintained in a greenhouse for approximately 10 d, after which time all treated plants were compared to untreated controls and visually evaluated for injury. Plant response ratings, summarized in

Table A, are based on a 0 to 100 scale where 0 is no effect and 100 is complete control. A dash (–) response means no test result.

Table A	Compound	Table A	Compound
1000 g ai/ha	1	1000 g ai/ha	1
Postemergence		Postemergence	
Barnyardgrass	60	Kochia	20
Blackgrass	70	Pigweed	80
Corn	10	Ragweed	90
Foxtail, Green	60	Ryegrass, Italian	90
Galium	100	Wheat	0

Table A	Compounds				Table A	Compounds			
500 g ai/ha	2	3	6	7	500 g ai/ha	2	3	6	7
Postemergence					Postemergence				
Barnyardgrass	20	10	0	30	Kochia	90	90	0	70
Blackgrass	20	10	20	10	Pigweed	90	100	0	90
Corn	10	10	0	10	Ragweed	90	90	20	70
Foxtail, Giant	–	–	0	10	Ryegrass, Italian	100	60	0	80
Foxtail, Green	70	20	–	–	Wheat	0	0	0	0
Galium	100	–	0	70					

Table A	Compounds							Table A	Compounds		
125 g ai/ha	2	3	4	5	6	7	8	31 g ai/ha	4	5	8
Postemergence								Postemergence			
Barnyardgrass	0	0	10	30	0	10	80	Barnyardgrass	10	20	50
Blackgrass	0	0	0	30	0	10	30	Blackgrass	0	0	20
Corn	10	0	0	20	0	0	20	Corn	0	20	0
Foxtail, Giant	–	–	–	–	0	0	80	Foxtail, Giant	–	–	60
Foxtail, Green	10	0	20	40	–	–	–	Foxtail, Green	10	20	–
Galium	90	–	70	90	0	50	90	Galium	40	90	90
Kochia	80	70	20	80	0	30	50	Kochia	0	70	40
Pigweed	80	80	70	100	0	80	100	Pigweed	50	70	90
Ragweed	80	60	20	80	0	0	100	Ragweed	0	30	80
Ryegrass, It.	60	10	20	80	–	30	80	Ryegrass, It.	0	70	40
Wheat	0	0	0	0	0	0	0	Wheat	0	0	0

Table A	Compound	Table A	Compound
1000 g ai/ha	1	1000 g ai/ha	1
Preemergence		Preemergence	
Barnyardgrass	80	Pigweed	60
Foxtail, Green	70	Ragweed	100
Kochia	70	Ryegrass, It.	100

Table A	Compounds				Table A	Compounds							
500 g ai/ha	2	3	6	7	125 g ai/ha	2	3	4	5	6	7	8	
Preemergence					Preemergence								
Barnyardgrass	0	0	30	0	Barnyardgrass	0	0	0	0	0	0	60	
Foxtail, Giant	-	-	0	0	Foxtail, Giant	-	-	-	-	0	0	70	
Foxtail, Green	0	0	-	-	Foxtail, Green	0	0	0	0	-	-	-	
Kochia	80	30	40	0	Kochia	0	10	0	10	0	0	10	
Pigweed	80	60	0	10	Pigweed	0	10	0	100	0	0	100	
Ragweed	90	50	0	0	Ragweed	40	0	0	80	0	0	30	
Ryegrass, It.	50	10	0	10	Ryegrass, It.	40	0	0	70	0	0	10	

Table A	Compounds			Table A	Compounds				
500 g ai/ha	2	3	7	125 g ai/ha	2	3	4	5	7
Preemergence				Preemergence					
Barnyardgrass	0	0	0	Barnyardgrass	0	0	0	0	0
Foxtail, Giant	-	-	0	Foxtail, Giant	-	-	-	-	0
Foxtail, Green	0	0	-	Foxtail, Green	0	0	0	0	-
Kochia	80	30	0	Kochia	0	10	0	10	0
Pigweed	80	60	10	Pigweed	0	10	0	100	0
Ragweed	90	50	0	Ragweed	40	0	0	80	0
Ryegrass, It.	50	10	10	Ryegrass, It.	40	0	0	70	0

Table A	Compounds			Table A	Compounds		
31 g ai/ha	4	5	8	31 g ai/ha	4	5	8
Preemergence				Preemergence			
Barnyardgrass	0	20	0	Pigweed	0	20	10
Foxtail, Green	0	0	0	Ragweed	0	20	0
Kochia	0	0	-	Ryegrass, It.	0	40	0

TEST B

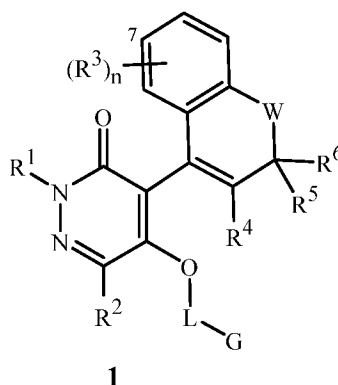
Plant species in the flooded paddy test selected from rice (*Oryza sativa*), sedge, umbrella (small-flower umbrella sedge, *Cyperus difformis*), ducksalad (*Heteranthera limosa*), and barnyardgrass (*Echinochloa crus-galli*) were grown to the 2-leaf stage for testing. At the time of treatment, test pots were flooded to 3 cm above the soil surface, treated by application of test compounds directly to the paddy water, and then maintained at that water depth for the duration of the test. Treated plants and controls were maintained in a greenhouse for 13 to 15 d, after which time all species were compared to controls and visually evaluated. Plant response ratings, summarized in Table B, are based on a scale of 0 to 100 where 0 is no effect and 100 is complete control. A dash (–) response means no test result.

Table B		Compounds						
250 g ai/ha		2	3	4	5	6	7	8
Flood								
15	Barnyardgrass	0	0	0	0	0	0	60
	Ducksalad	0	0	0	0	0	0	90
	Rice	0	0	0	0	0	0	0
	Sedge, Umbrella	0	50	0	0	0	0	95

CLAIMS

What is claimed is:

1. A compound selected from Formula 1, *N*-oxides and salts thereof,



5 wherein

W is $-C(R^7)(R^8)-$ or $-O-$;

R^1 is H, C_1-C_7 alkyl, C_3-C_8 alkylcarbonylalkyl, C_3-C_8 alkoxy carbonylalkyl, C_4-C_7 alkylcycloalkyl, C_2-C_7 alkenyl, C_3-C_7 alkynyl, C_3-C_7 cycloalkyl, C_4-C_7 cycloalkylalkyl, C_2-C_5 cyanoalkyl, C_1-C_4 nitroalkyl, C_2-C_7 haloalkoxyalkyl, C_1-C_7 haloalkyl, C_2-C_7 haloalkenyl, C_2-C_7 alkoxyalkyl, C_3-C_7 alkylthioalkyl or C_1-C_7 alkoxy;

R^2 is H, halogen, cyano, $-CHO$, C_1-C_7 alkyl, C_3-C_8 alkylcarbonylalkyl, C_3-C_8 alkoxy carbonylalkyl, C_1-C_4 alkylcarbonyl, C_2-C_7 alkylcarbonyloxy, C_4-C_7 alkylcycloalkyl, C_2-C_7 alkenyl, C_3-C_7 alkynyl, C_1-C_4 alkylsulfinyl, C_1-C_4 alkylsulfonyl, C_1-C_4 alkylamino, C_2-C_8 dialkylamino, C_3-C_7 cycloalkyl, C_4-C_7 cycloalkylalkyl, C_2-C_5 cyanoalkyl, C_1-C_4 nitroalkyl, C_2-C_7 haloalkoxyalkyl, C_1-C_7 haloalkyl, C_2-C_7 haloalkenyl, C_2-C_7 alkoxyalkyl, C_1-C_7 alkoxy, C_1-C_5 alkylthio or C_2-C_3 alkoxy carbonyl;

each R^3 is independently H, halogen, nitro, cyano, C_1-C_5 alkyl, C_2-C_5 alkenyl, C_2-C_5 alkynyl, C_3-C_5 cycloalkyl, C_4-C_5 cycloalkylalkyl, C_1-C_5 haloalkyl, C_2-C_5 haloalkenyl, C_3-C_5 haloalkynyl, C_2-C_5 alkoxyalkyl, C_1-C_5 alkoxy, C_1-C_5 haloalkoxy, C_1-C_5 alkylthio, C_1-C_4 alkylsulfinyl, C_1-C_4 alkylsulfonyl, C_1-C_4 haloalkylthio or C_2-C_5 alkoxy carbonyl;

n is 0 to 3;

each R^4 is independently H, halogen, nitro, cyano, C_1-C_5 alkyl, C_2-C_5 alkenyl, C_2-C_5 alkynyl, C_3-C_5 cycloalkyl, C_4-C_5 cycloalkylalkyl, C_1-C_5 haloalkyl, C_2-C_5 haloalkenyl, C_3-C_5 haloalkynyl, C_2-C_5 alkoxyalkyl, C_1-C_5 alkoxy, C_1-C_5 haloalkoxy, C_1-C_5 alkylthio, C_1-C_4 alkylsulfinyl, C_1-C_4 alkylsulfonyl, C_1-C_4 haloalkylthio or C_2-C_5 alkoxy carbonyl;

R⁵ is H or C₁–C₅ alkyl;

R⁶ is H or C₁–C₅ alkyl;

R⁷ is H or C₁–C₅ alkyl;

R⁸ is H or C₁–C₅ alkyl;

5 L is a direct bond, C₁–C₄ alkanediyl or C₂–C₄ alkenediyl;

G is H, C(=O)R⁹, C(=S)R⁹, CO₂R¹⁰, C(=O)SR¹⁰, S(O)₂R⁹, C(=O)N(R¹¹)(R¹²),

S(=O)₂N(R¹¹)(R¹²) or P(=O)(R¹³)(R¹⁴); or C₁–C₇ alkyl, C₂–C₅ alkenyl, C₂–C₄

alkynyl, C₁–C₇ haloalkyl, C₂–C₅ haloalkenyl, C₂–C₄ haloalkynyl, C₂–C₄

alkoxyalkyl, C₃–C₆ cycloalkyl or C₄–C₇ cycloalkylalkyl; or a 5- or 6-membered

10 heterocyclic ring optionally substituted by halogen, C₁–C₄ alkyl or C₁–C₄ haloalkyl;

R⁹ and R¹¹ are independently H, C₁–C₇ alkyl, C₃–C₇ alkenyl, C₃–C₇ alkynyl, C₃–C₇

cycloalkyl, C₁–C₇ haloalkyl, C₃–C₇ haloalkenyl, C₂–C₇ alkoxyalkyl or C₄–C₇

cycloalkylalkyl; or phenyl, benzyl, or a 5- to 6-membered heterocyclic ring, each

15 phenyl, benzyl or heterocyclic ring optionally substituted by halogen, C₁–C₄ alkyl or C₁–C₄ haloalkyl;

R¹⁰ is C₁–C₇ alkyl, C₃–C₇ alkenyl, C₃–C₇ alkynyl, C₃–C₇ cycloalkyl, C₂–C₇

haloalkyl, C₃–C₇ haloalkenyl, C₂–C₇ alkoxyalkyl or C₄–C₇ cycloalkylalkyl; or

phenyl, benzyl or a 5- to 6-membered heterocyclic ring, each phenyl, benzyl or

20 heterocyclic ring optionally substituted by halogen, C₁–C₄ alkyl or C₁–C₄ haloalkyl;

R¹² is H, C₁–C₇ alkyl, C₂–C₇ alkenyl, C₂–C₇ alkynyl, C₃–C₇ cycloalkyl, C₄–C₇

cycloalkylalkyl, C₁–C₇ haloalkyl or C₂–C₇ alkoxyalkyl;

R¹³ is C₁–C₇ alkyl or C₁–C₇ alkoxy; and

25 R¹⁴ is C₁–C₇ alkyl or C₁–C₇ alkoxy.

2. The compound of Claim 1 wherein

R¹ is H, C₁–C₇ alkyl, C₃–C₈ alkylcarbonylalkyl, C₃–C₈ alkoxycarbonylalkyl, C₄–C₇

alkylcycloalkyl, C₃–C₇ cycloalkyl, C₄–C₇ cycloalkylalkyl, C₁–C₇ haloalkyl,

C₂–C₇ haloalkenyl, C₂–C₇ alkoxyalkyl or C₁–C₇ alkoxy;

30 R² is H, halogen, cyano, -CHO, C₁–C₇ alkyl, C₃–C₈ alkylcarbonylalkyl, C₃–C₈

alkoxycarbonylalkyl, C₁–C₄ alkylcarbonyl, C₂–C₇ alkylcarbonyloxy, C₄–C₇

alkylcycloalkyl, C₃–C₇ cycloalkyl, C₄–C₇ cycloalkylalkyl, C₂–C₇

haloalkoxyalkyl, C₁–C₇ haloalkyl, C₂–C₇ alkoxyalkyl, C₁–C₇ alkoxy, C₁–C₅

alkylthio or C₂–C₃ alkoxycarbonyl;

35 each R³ is independently H, halogen, C₁–C₅ alkyl, C₃–C₅ cycloalkyl, C₁–C₅ haloalkyl,

C₁–C₅ alkoxy or C₁–C₅ haloalkoxy;

n is 0 to 2;

R⁴ is H, halogen, C₁–C₃ alkyl, C₃–C₄ cycloalkyl, C₁–C₃ haloalkyl or C₁–C₃ alkoxy;

L is a direct bond or C₁–C₂ alkanediyl;

G is H, C(=O)R⁹, C(=S)R⁹, CO₂R¹⁰, C(=O)SR¹⁰, CON(R¹¹)(R¹²) or P(=O)(R¹³)(R¹⁴);
or C₁–C₄ alkyl, C₂–C₄ alkenyl, C₂–C₄ alkynyl, C₁–C₄ haloalkyl, C₂–C₄
haloalkenyl, C₂–C₄ haloalkynyl, C₂–C₄ alkoxyalkyl, C₃–C₆ cycloalkyl or C₄–C₇
cycloalkylalkyl;

R⁹ and R¹¹ are independently H, C₁–C₇ alkyl, C₃–C₇ alkenyl, C₃–C₇ alkynyl, C₃–C₇
cycloalkyl or C₁–C₇ haloalkyl; or phenyl, benzyl, or a 6-membered heterocyclic
ring, each phenyl, benzyl or heterocyclic ring optionally substituted by halogen,
C₁–C₄ alkyl or C₁–C₄ haloalkyl;

R¹⁰ is C₁–C₇ alkyl, C₃–C₇ alkenyl, C₃–C₇ cycloalkyl, C₂–C₇ haloalkyl or C₃–C₇
haloalkenyl; or phenyl, benzyl or a 6-membered heterocyclic ring, each phenyl,
benzyl or heterocyclic ring optionally substituted by halogen, C₁–C₄ alkyl or
C₁–C₄ haloalkyl;

R¹² is H, C₁–C₇ alkyl, C₂–C₇ alkenyl, C₂–C₇ alkynyl or C₃–C₇ cycloalkyl;

R¹³ is C₁–C₄ alkyl or C₁–C₄ alkoxy; and

R¹⁴ is C₁–C₄ alkyl or C₁–C₄ alkoxy.

3. The compound of Claim 2 wherein

R¹ is H, C₁–C₇ alkyl, C₃–C₈ alkylcarbonylalkyl, C₃–C₈ alkoxy carbonylalkyl, C₄–C₇
alkylcycloalkyl, C₃–C₇ cycloalkyl, C₄–C₇ cycloalkylalkyl, C₂–C₇ alkoxyalkyl or
C₁–C₇ alkoxy;

R² is H, halogen, cyano, -CHO, C₁–C₇ alkyl, C₄–C₇ alkylcycloalkyl, C₃–C₇ cycloalkyl,
C₄–C₇ cycloalkylalkyl, C₂–C₇ haloalkoxyalkyl, C₁–C₇ haloalkyl, C₂–C₇
alkoxyalkyl, C₁–C₇ alkoxy or C₁–C₅ alkylthio;

each R³ is independently H, halogen, C₁–C₅ alkyl, C₁–C₅ haloalkyl, C₁–C₅ alkoxy or
C₁–C₅ haloalkoxy;

n is 0 or 1;

R⁴ is H, halogen, C₁–C₂ alkyl, cyclopropyl or C₁–C₂ haloalkyl;

L is a direct bond;

G is H, C(=O)R⁹, CO₂R¹⁰, CON(R¹¹)(R¹²) or P(=O)(R¹³)(R¹⁴); or C₁–C₄ alkyl, C₂–C₄
alkenyl, C₁–C₄ haloalkyl, C₂–C₄ haloalkenyl, C₂–C₄ alkoxyalkyl, C₃–C₆
cycloalkyl or C₄–C₇ cycloalkylalkyl;

R⁹ and R¹¹ are independently H, C₁–C₇ alkyl or C₃–C₇ alkenyl; or phenyl, benzyl, each
phenyl or benzyl optionally substituted by halogen, C₁–C₄ alkyl or C₁–C₄
haloalkyl;

R¹⁰ is C₁–C₇ alkyl or C₃–C₇ cycloalkyl; or phenyl or benzyl, each phenyl or benzyl
optionally substituted by halogen, C₁–C₄ alkyl or C₁–C₄ haloalkyl;

R¹² is H, C₁–C₇ alkyl or C₃–C₇ cycloalkyl;

R¹³ is C₁–C₂ alkyl or C₁–C₂ alkoxy; and

R¹⁴ is C₁–C₂ alkyl or C₁–C₂ alkoxy.

4. The compound of Claim 3 wherein

5 R¹ is H, C₁–C₇ alkyl, C₄–C₇ alkylcycloalkyl, C₃–C₇ cycloalkyl, C₄–C₇ cycloalkylalkyl or C₂–C₇ alkoxyalkyl;

R² is H, halogen, cyano, C₁–C₇ alkyl, C₂–C₇ haloalkoxyalkyl, C₁–C₇ haloalkyl, C₂–C₇ alkoxyalkyl, C₁–C₇ alkoxy or C₁–C₅ alkylthio;

each R³ is independently H, halogen, methyl, ethyl, CF₃ or –OCHF₂;

10 R⁴ is H, halogen, methyl, ethyl or CF₃;

G is H, C(=O)R⁹, CO₂R¹⁰ or P(=O)(R¹³)(R¹⁴); or C₁–C₄ alkyl, C₁–C₄ haloalkyl, C₂–C₄ alkoxyalkyl or C₃–C₆ cycloalkyl;

R⁹ is H or C₁–C₇ alkyl; or benzyl optionally substituted by halogen, C₁–C₄ alkyl or C₁–C₄ haloalkyl; and

15 R¹⁰ is C₁–C₇ alkyl; or phenyl optionally substituted by halogen, C₁–C₄ alkyl or C₁–C₄ haloalkyl.

5. The compound of Claim 4 wherein

R¹ is H, C₁–C₇ alkyl, C₃–C₇ cycloalkyl, C₄–C₇ cycloalkylalkyl or C₂–C₇ alkoxyalkyl;

R² is H, halogen, cyano, C₁–C₇ alkyl, C₁–C₇ haloalkyl or C₁–C₇ alkoxy;

20 each R³ is independently H, F, Cl, Br or methyl;

R⁴ is H, F, Cl, Br or methyl;

R⁵ is H or methyl;

R⁶ is H or methyl;

R⁷ is H or methyl;

25 R⁸ is H or methyl;

G is H, C(=O)R⁹ or CO₂R¹⁰; or C₂–C₄ alkoxyalkyl or C₃–C₆ cycloalkyl;

R⁹ is C₁–C₇ alkyl; or benzyl optionally substituted by halogen, C₁–C₄ alkyl or C₁–C₄ haloalkyl; and

R¹⁰ is CH₃, CH₂CH₃, CH₂CH₂CH₃, Ph, Ph(4-Cl), Ph(3-CF₃) or Ph(4-CF₃).

30 6. The compound of Claim 5 wherein

W is –C(R⁷)(R⁸)–;

R¹ is H, C₁–C₇ alkyl, C₃–C₇ cycloalkyl or C₂–C₇ alkoxyalkyl;

R² is H, Cl, Br, I, cyano, methyl, CF₃ or methoxy;

n is 0;

35 R⁴ is methyl;

R⁵ is H;

R⁶ is H;

R⁷ is H;
 R⁸ is H; and
 G is H.

7. The compound of Claims 5 wherein

5 W is -O-;
 R¹ is H or C₁-C₇ alkyl;
 R² is H, Cl, methyl or methoxy;
 n is 0;
 R⁴ is methyl;
 10 R⁵ is H;
 R⁶ is H; and
 G is H.

8. A compound of Claims 1 selected from the group consisting of
 4-(3,4-dihydro-2-methyl-1-naphthalenyl)-5-hydroxy-2,6-dimethyl-3-(2*H*)-
 15 pyridazinone; and
 5-hydroxy-2,6-dimethyl-4-(3-methyl-2*H*-1-benzopyran-4-yl)-3-(2*H*)-pyridazinone.

9. A herbicidal composition comprising a compound of Claim 1 and at least one
 component selected from the group consisting of surfactants, solid diluents and liquid
 diluents.

20 10. A herbicidal composition comprising a compound of Claim 1, at least one
 additional active ingredient selected from the group consisting of other herbicides and
 herbicide safeners, and at least one component selected from the group consisting of
 surfactants, solid diluents and liquid diluents.

11. A herbicidal mixture comprising (a) a compound of Claim 1, and (b) at least one
 25 additional active ingredient selected from (b1) photosystem II inhibitors, (b2) acetohydroxy
 acid synthase (AHAS) inhibitors, (b3) acetyl-CoA carboxylase (ACCase) inhibitors, (b4)
 auxin mimics, (b5) 5-enol-pyruvylshikimate-3-phosphate (EPSP) synthase inhibitors, (b6)
 photosystem I electron diverters, (b7) protoporphyrinogen oxidase (PPO) inhibitors, (b8)
 glutamine synthetase (GS) inhibitors, (b9) very long chain fatty acid (VLCFA) elongase
 30 inhibitors, (b10) auxin transport inhibitors, (b11) phytoene desaturase (PDS) inhibitors,
 (b12) 4-hydroxyphenyl-pyruvate dioxygenase (HPPD) inhibitors, (b13) homogentisate
 solanesyltransferase (HST) inhibitors, (b14) cellulose biosynthesis inhibitors, (b15) other
 herbicides including mitotic disruptors, organic arsenicals, asulam, bromobutide,
 cinmethylin, cumyluron, dazomet, 2-[(2,4-dichlorophenyl)methyl]-4,4-dimethyl-3-
 35 isoxazolidinone, difenzoquat, dymron, etobenzanid, flurenol, fosamine,
 fosamine-ammonium, hydantocidin, metam, methyldymron, oleic acid, oxaziclomefone,

pelargonic acid and pyributicarb, and (b16) herbicide safeners; and salts of compounds of (b1) through (b16).

12. A method for controlling the growth of undesired vegetation comprising contacting the vegetation or its environment with a herbicidally effective amount of a
5 compound of Claim 1.

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2018/037330

A. CLASSIFICATION OF SUBJECT MATTER
INV. C07D237/16 C07D405/04 A01N43/58
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
C07D A01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, CHEM ABS Data, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2015/168010 A1 (DU PONT [US]) 5 November 2015 (2015-11-05) cited in the application claim 1, compounds I wherein X is -C(R6)=C(R7)-; claims 1-13; examples -----	1-12
A	WO 2017/074992 A1 (DU PONT [US]) 4 May 2017 (2017-05-04) cited in the application claim 1, compounds I wherein A is A-3; claims 1-12; examples -----	1-12



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

27 July 2018

Date of mailing of the international search report

08/08/2018

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

Ladenburger, Claude

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2018/037330

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2015168010	A1	05-11-2015	
		AU 2015253505 A1	27-10-2016
		BR 112016024443 A2	15-08-2017
		CA 2946138 A1	05-11-2015
		CL 2016002731 A1	11-08-2017
		CN 106458926 A	22-02-2017
		EA 201692186 A1	28-04-2017
		EP 3137456 A1	08-03-2017
		JP 2017514833 A	08-06-2017
		KR 20160146963 A	21-12-2016
		PE 03262017 A1	18-04-2017
		PH 12016502154 A1	19-12-2016
		SG 11201608540W A	29-11-2016
		TW 201545650 A	16-12-2015
		US 2017050953 A1	23-02-2017
		UY 36101 A	30-11-2015
		WO 2015168010 A1	05-11-2015
WO 2017074992	A1	04-05-2017	
		AR 106521 A1	24-01-2018
		AU 2016346303 A1	10-05-2018
		CA 3003419 A1	04-05-2017
		WO 2017074992 A1	04-05-2017