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(54) Title: COMPLEX LIQUID FERTILIZER

(57) Abstract: The family of complex liquid fertilizers is for leave and soil feeding of plants. They comprise contain carbamide - N-P-K, phosphoric acid and potassium hydroxide, as well as N, P₂O₅, K₂O and at least one of the following microelements B, Cu, Fe, Mn, Mo, Zn, and an efficient amount of the EDTA chelating agent. Furthermore, (in % by weight) N is 0 up to 34, P₂O₅ is 0 up to 16, K₂O is 0 up to 16, and said microelements bonded in a chelate form have the following concentration (in % by weight) - Mo - 0,001 up to 5,0, Zn - 0,01 up to 15,0, Fe - 0,2 up to 5,0, Cu - 0,01 up to 4,0, Mn - 0,04 up to 0,7, B - 0,01 up to 10,0, wherein it contains (in % by weight) MgO - 1 up to 5,2, S - 0 up to 6 and CaO - 0 up to 16.

COMPLEX LIQUID FERTILIZER

FIELD OF THE INVENTION

5 The complex liquid fertilizer is intended for leave and soil feeding of plants.

BACKGROUND OF THE INVENTION

A complex liquid fertilizer - N-P-K is known [BG 63533 B1] comprising carbamide, phosphoric acid and potassium hydroxide, as well as N
10 - 9 up to 12 % by weight, P_2O_5 - 9 – 11 % by weight, K_2O 9 up to 11 % by weight, at least one of the following microelements in amounts in % by weight: 0,01 – 1 B; 0,002 – 0,2 Co; 0,02 – 0,2 Cu; 0,02 – 0,2 Fe; 0,01 – 1 Mn; 0,001 – 0,1 Mo; 0,002 – 0,2 Zn and an efficient amount of at least one of the
15 following chelating agents - sodium, potassium or ammonium salts of EDTA, DPTA, EDDHA, HEEDTA, EDDHMA, EDDCHA or the acids themselves.

The known complex liquid fertilizer is difficult to be formulated with an optimum ratio among the basic macroelements N:P:K and the necessary microelements. Therefore, it does not always possess the complex properties
20 required for achieving high yields and high quality of the flora treated.

SUMMARY OF THE INVENTION

The objective of the invention is to provide a complex liquid fertilizer,
25 with an optimum ratio among the basic macroelements N:P:K and the necessary microelements, wherein the fertilizer always possesses the complex properties required for achieving high yields and high quality of the flora treated, including the one grown by man.

This objective can be met by providing a complex liquid fertilizer - N-P-K, comprising carbamide, phosphoric acid and potassium hydroxide, as well as N, P₂O₅, K₂O and at least one of the following microelements B, Cu, Fe, Mn, Mo, Zn, and an efficient amount the EDTA chelating agent. In addition, it
5 contains (in % by weight) N – 0 up to 34, P₂O₅ – 0 up to 16, K₂O – 0 up to 16, while the microelements bonded in a chelate form have the following concentration (in % by weight) – Mo 0,001 up to 5,0, Zn 0,01 up to 15,0, Fe 0,2 up to 5,0, Cu 0,01 up to 4,0, Mn 0,04 up to 0,7, B 0,01 up to 10,0, wherein it contains also (in % by weight) MgO 1 up to 5,2, **S 0 up to 6** and CaO 0 up to
10 16.

A biocomponent can be added to the complex liquid fertilizer - N-P-K (in % by weight) - 0 up to 16.

The biocomponent can be isolated and purified and can be of the bacteria family Bacillaceae type Firmicutes.

15 A fertilizer family of this complex liquid fertilizer provides for an optimum ratio among the basic macroelements N:P:K and Ca, together with the necessary microelements and creates synergy which always provides for the complex properties required for achieving high yields and high quality of the flora treated, including the one grown by man.

20

EXAMPLES OF EMBODIMENTS OF THE INVENTION

The invention can be illustrated by the following non-limiting examples (refer to Table 1).

Table No.1

No.	Content of the following in % by weight						Content of microelements, in % by weight								Water content up to 100 % by weight in the solution	Organic additive content, in % by weight	Composition Index
	N	P	K	Ca	Mo	Zn	Fe	Cu	Mn	B	S	MgO					
	8	4	4	2	0.001	0.090	0.020	0.002	0.080	1.500	-	-					
1	8	4	4	2	0.001	0.090	0.020	0.002	0.080	1.500	-	-	80.307	-	M		
2	8	4	4	2	0.001	0.090	0.020	0.002	0.080	1.500	-	-	73.307	7.0	O		
3	12	0.1	12	0.1	0.001	0.004	0.200	0.030	0.060	0.200	-	-	75.305	-	M		
4	4.5	4.5	9	0.1	0.003	0.600	1.000	0.002	0.200	0.300	-	-	79.795	-	M		
5	4.5	4.5	9	0.1	0.003	0.600	1.000	0.002	0.200	0.300	-	-	67.795	12.0	O		
6	2	14	14	0.2	0.001	0.500	0.500	0.180	0.002	0.100	-	-	68.517	-	M		
7	14	2.0	14	0.1	0.002	6.000	0.070	0.020	0.050	0.030	-	-	63.728	-	M		
8	4	6	8	0.2	0.001	1.500	0.500	0.010	0.090	0.500	-	-	79.199	-	M		
9	4	6	8	0.2	0.001	1.500	0.500	0.010	0.090	0.500	-	-	69.199	10.0	O		
10	7	14	7	0.15	0.006	0.040	0.400	2.350	0.200	1.100	-	-	67.754	-	M		
11	7	14	7	0.15	0.006	0.040	0.400	2.350	0.200	1.100	1.300	-	56.454	10.0	O		
12	3	12	15	0.25	0.004	0.090	0.100	0.010	0.250	0.750	-	-	68.546	-	M		
13	3	12	15	0.25	0.004	0.090	0.100	0.010	0.250	0.750	-	-	60.546	8.0	O		
14	3	15	15	0.12	0.006	0.030	0.900	0.040	0.070	1.300	-	-	64.534	-	M		
15	3	15	15	0.12	0.006	0.030	0.900	0.040	0.070	1.300	-	-	55.534	9.0	O		
16	12	4	12	0.2	0.003	3.100	0.200	0.009	0.600	0.700	1.000	-	66.188	-	M		
17	16	0	0	0	0.008	4	0.005	0.004	0.05	3	5	-	71.933	-	M		
18	34	0	0	0	0.005	4	0.1	0.05	-	4	-	3.5	54.345	-	M		
19	8	0	0	16	0.001	1	0.01	0.2	-	0.6	-	4	70.189	-	M		
20	3	8	12	0.1	0.003	0.6	0.1	0.02	0.02	5.0	-	-	61.157	10	O		

Index "O" indicates the presence of an organic additive in the composition, Index "M" refers to a mineral complex fertilizer

Water is used as an alkali for each different modification of the liquid fertilizer, in an amount supplementing their composition to 100% by weight.

The organic additive in the composition contains fungal spores which develop on the inside and outside on the plant root and form symbiotic relation
5 with it. Thus, they enhance the ability of the treated plant to better uptake the phosphorus (P) from the soil, make it more resistant in case of drought, adjust the water balance and contribute to better development and growth. The plant is in symbiosis with these favoured microorganisms which make it more resistant in case of higher soil temperature and are appropriate for different soil
10 types. Furthermore, these fungal spores have a positive effect on the plant development at different root pathogenic alterations and make it more resistant to the impact of heavy metals.

In addition to the phosphorus (P) uptake from the soil, these spores assist the absorption of the remaining macroelements transporting them from the soil
15 into the plant. Thus, the yield is increased, the development of the root system is improved and the soil is activated in a biological manner.

These microorganisms are naturally occurring in a free form; they are environmentally friendly, do not contain chemicals harmful for the environment and are completely biodegradable.

20 The joint application of this organic additive and the liquid fertilizer containing the basic macroelements (N, P, K, Ca) and microelements (Mo, Zn, Fe, Cu, Mn, B, Mg, S) described according to the invention has an increased positive effect on the treated culture development and yield.

The examples shown in Table 1 illustrate the synergy among the
25 components in different applications.

1 – complex liquid fertilizer containing the basic macroelements (N, P, K, Ca) and microelements (Mo, Zn, Fe, Cu, Mn, B), which joint activity improves the physiological condition of the treated plants, and the higher

boron content (B) makes it appropriate for sunflower cultures for faster growth of the leave mass, consolidation of the stem and joint efflorescence.

2 – complex organic liquid fertilizer containing the basic macroelements (N, P, K, Ca) and microelements (Mo, Zn, Fe, Cu, Mn, B) and an organic
5 additive which helps the complete uptake of macroelements; the synergy among them increases the treated culture yields and quality.

3 – provides the necessary amount of macroelements (N, P, K, Ca) and microelements (Mo, Zn, Fe, Cu, Mn, B) and is with a higher potassium content (K) for the normal plant development, which joint action makes potatoes less
10 vulnerable to blue and black spots, assists the grapes in sugar formation and branch ripening, and increases the durability of vegetable cultures.

4 – balanced complex liquid fertilizer containing the basic macroelements (N, P, K, Ca) and microelements (Mo, Zn, Fe, Cu, Mn, B) which joint action increases their physiological activity and has beneficial
15 effect on the quality parameters of the relevant culture; it is appropriate for leave feeding of any type of cultures.

5 – the positive properties of the liquid fertilizer specified in example 4 are enhanced through its combination with the organic additive which increases the manuring effect.

20 6 – complex liquid fertilizer containing the basic macroelements (N, P, K, Ca) and microelements (Mo, Zn, Fe, Cu, Mn, B) in synergy with the higher phosphorus (P) and potassium (K) content which provides for higher fruit strength and size, and leads to increasing fruit durability.

7 – complex liquid fertilizer containing the basic macroelements (N, P,
25 K, Ca) and microelements (Mo, Zn, Fe, Cu, Mn, B) necessary for the plant normal development, which are in combination with a higher zinc (Zn) content and thus make the fertilizer rather appropriate for use in cultures, for e.g., maize, vulnerable to zinc deficiency with the purpose of its overcoming.

8 – complex liquid fertilizer containing the basic macroelements (N, P, K, Ca) and microelements (Mo, Zn, Fe, Cu, Mn, B) necessary for the normal development of plants, having a higher iron (Fe) content which assists in avoidance and elimination of the iron chlorosis.

5 9 – complex liquid fertilizer containing the basic macroelements (N, P, K, Ca) and microelements (Mo, Zn, Fe, Cu, Mn, B) necessary for the plant normal development, which composition comprises an organic additive; their synergy assists in their complete uptake by the treated plant.

10 10 – complex liquid fertilizer containing the basic macroelements (N, P, K, Ca) and microelements (Mo, Zn, Fe, Cu, Mn, B) necessary for stimulation of the treated culture optimum development, containing a higher copper (Cu) concentration which joint action with the remaining micro- and macroelements assists in avoidance and elimination the copper (Cu) deficiency and leads to the grain crops cold-resistance, stability, and increase in their yield and quality.

15 11 – complex liquid fertilizer containing the basic macroelements (N, P, K, Ca) and microelements (Mo, Zn, Fe, Cu, Mn, B) necessary for the plant normal development, which synergy with the organic additive increases the manuring effect.

20 12 – complex liquid fertilizer containing the basic macroelements (N, P, K, Ca) and microelements (Mo, Zn, Fe, Cu, Mn, B) necessary for the plant normal development, which, in combination with the higher manganese (Mn) content, stimulates the physiological activity, increases the leave quality and colour and the treated plant immunity.

25 13 - complex liquid fertilizer containing the basic macroelements (N, P, K, Ca) and microelements (Mo, Zn, Fe, Cu, Mn, B) necessary for the plant normal development, which, in combination with the higher manganese (Mn) content, stimulates the physiological activity, increases the leave quality and colour and the treated plant immunity, while the synergy with the organic additive contained increases the manuring effect.

14 – complex liquid fertilizer containing the basic macroelements (N,P,K,Ca) and microelements (Mo, Zn, Fe, Cu, Mn, B) necessary for the plant normal development, which, in combination with the higher boron (B) content assists efflorescence and fruit making.

5 15 – complex liquid fertilizer containing the basic macroelements (N, P, K, Ca) and microelements (Mo, Zn, Fe, Cu, Mn, B) necessary for the plant normal development, which, in combination with the higher boron (B) content assists efflorescence and fruit making, wherein the joint action of the comprised organic additive increases significantly the manuring effect.

10 16 – complex liquid fertilizer containing the basic macroelements (N, P, K, Ca) and microelements (Mo, Zn, Fe, Cu, Mn, B) necessary for the plant normal development, which, in combination with the higher sulphur (S) content increases synergy and leads to reducing the vulnerability to mildew.

15 17 – liquid fertilizer with a high nitrogen (N) content which comprises the basic microelements (Mo, Zn, Fe, Cu, Mn, B, S) and contains higher amount of sulphur (S); this combination of micro- and macroelements makes it extremely appropriate for rape and sunflower, leads to improvement of their efflorescence and oil content, and increases their yields.

20 18 – liquid fertilizer with a high nitrogen (N) content which composition includes the basic microelements (Mo, Zn, Fe, Cu, B, Mg), in combination with a higher boron (B) and magnesium (Mg) content for growth stimulation in the initial phases of the plant development.

25 19 – liquid calcium-ammonia nitrate containing also the basic microelements (Mo, Zn, Fe, Cu, B, Mg); the synergy among these basic components within the fertilizer composition makes it particularly appropriate for use through the fertigation process, assists the treated culture root system development, reduces the soil acidity, provides for the necessary amount of calcium (Ca) and the fruit strength increase after treatment.

20 - complex liquid fertilizer containing the basic macroelements (N, P, K, Ca) and microelements (Mo, Zn, Fe, Cu, Mn, B) necessary for the plant normal development, which, in combination with the higher boron (B) content assists even efflorescence and ripening, increases the yield; it comprises also
5 an organic additive which increases the manuring effect.

For preparation of a complex liquid fertilizer concentrate, two solutions are prepared in advance – one of which contains the basic macro components (N, P, K, Ca) and the other – the microelements (Mo, Zn, Fe, Cu, Mn, B, S, Mg) in definite concentrations. The examples shown in Table 1 are obtained
10 through their mixing, while avoiding precipitation and obtaining a high-quality and clear concentrated solution having pH from 6.5 up to 7.5. Finally, an organic additive in a definite concentration is added for the examples particularly specified.

The elements used for the production of complex liquid fertilizers are
15 introduced using known methods, and namely: nitrogen (N) from carbamide $\text{CO}(\text{NH}_2)_2$, ammonia sulphate $(\text{NH}_4)_2\text{SO}_4$, phosphorus (P) from phosphoric acid H_3PO_4 (75 – 85 %), potassium (K) from potassium base (KOH) – in solid state or in the form of a solution, Ca from calcium hydroxide $\text{Ca}(\text{OH})_2$; microelements are introduced in the form of water soluble salts thereof, and
20 namely: molybdenum from ammonia molybdate $(\text{NH}_4)_6\text{Mo}_7\text{O}_{24} \cdot 4\text{H}_2\text{O}$, zinc (Zn) from zinc sulphate $\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$, iron (Fe) from iron sulphate $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$, copper (Cu) from copper sulphate $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$, manganese (Mn) from manganese sulphate $\text{MnSO}_4 \cdot \text{H}_2\text{O}$, boron (B) from boric acid (H_3BO_3), sulphur (S) from ammonia sulphate $(\text{NH}_4)_2\text{SO}_4$, magnesium (Mg)
25 from magnesium hydroxide $\text{Mg}(\text{OH})_2$.

The fertilizer prepared in this way contains the necessary amount of nutrients (micro- and macroelements) in a form accessible for the plants. It characterizes in that nitrogen is basically in an amide form and thus, it eliminates the hazard of nitrate accumulation in the treated plants. It was

experimentally established that the family of complex liquid fertilizers developed has no damaging effect on the plant leaves and has a beneficial effect on the root and drop feeding.

The family of complex liquid fertilizers developed meets all parameters and is in compliance with the modern requirements to liquid fertilizers.

The fertilizers developed according to the invention are used for treating: winter wheat, maize, sunflower and rape.

Table No.2 illustrates examples for the yield of a part of the cultures treated with different modifications of the liquid fertilizer according to the invention and a comparison is made with non-treated areas.

Liquid fertilizer compositions	Winter wheat	Maize	Sunflower	Rape
Example 20	420 kg/decare	630 kg/decare	270 kg/decare	260 kg/decare
Example 16	435 kg/decare	645 kg/decare	245 kg/decare	275 kg/decare
Example 17	410 kg/decare	625 kg/decare	250 kg/decare	290 kg/decare
Example 19	430 kg/decare	640 kg/decare	260 kg/decare	280 kg/decare
Example 11	480 kg/decare	670 kg/decare	300 kg/decare	310 kg/decare
Non-treated areas	380 kg/decare	600 kg/decare	210 kg/decare	240 kg/decare

Yield increase has been established experimentally during treatment of vegetable and fruit plants, and moreover, the beneficial effect is observed also during leave feeding of vineyards, flowers and decorative bushes.

When the complex liquid fertilizers for leave and root feeding developed according to the invention comprise also an organic additive with a concentration up to 15% by weight, the degree of uptake and the manuring efficiency are also improved.

All of the complex liquid fertilizers developed according to the invention are universal. They allow for satisfying the specific demands of nutrients in

different amounts for the separate plant species through modification of the ratio among the basic macroelements (N, P, K, Ca) and microelements (Mo, Zn, Fe, Cu, Mn, B, S, Mg), wherein they provide for optimum mineral feeding and are appropriate for leave, as well as root and drop feeding, for increasing
5 the yield and quality of the crops grown.

PATENT CLAIMS

1. A complex liquid fertilizer - N-P-K, comprising carbamide, phosphoric acid and potassium hydroxide, as well as N, P₂O₅, K₂O and at least
5 one of the following microelements B, Cu, Fe, Mn, Mo, Zn, and an efficient amount of the EDTA chelating agent, **characterized in that** (in % by weight) N is 0 up to 34, P₂O₅ is 0 up to 16, K₂O is 0 up to 16, and said microelements bonded in a chelate form have the following concentration (in % by weight) -
10 Mo - 0,001 up to 5,0, Zn - 0,01 up to 15,0, Fe - 0,2 up to 5,0, Cu - 0,01 up to 4,0, Mn - 0,04 up to 0,7, B - 0,01 up to 10,0, wherein it contains (in % by weight) MgO - 1 up to 5,2, S - 0 up to 6 and CaO - 0 up to 16.

2. A complex liquid fertilizer - N-P-K according to claim 1, characterized in that a biocomponent is added to the fertilizer (in % by weight)
15 - 0 up to 16.

3. A complex liquid fertilizer - N-P-K according to claim 2, characterized in that said biocomponent is isolated and purified and is of the bacteria family *Bacillaceae* type Firmicutes.

INTERNATIONAL SEARCH REPORT

International application No
PCT/BG2013/000030

A. CLASSIFICATION OF SUBJECT MATTER
 INV. C05B17/02 C05F11/08 C05G3/00 C05C11/00 C05D1/00
 C05D9/02
 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)
 C05B C05F C05G C05D

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, WPI Data, BIOSIS, COMPENDEX

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 125 393 A (KOHL WILHELM [DE] ET AL) 14 November 1978 (1978-11-14) claims examples 2,21	1-3
X	WO 99/32419 A1 (PONS ALEXANDER LEENDERT FRANK [NZ]) 1 July 1999 (1999-07-01) claims page 6, line 15 - page 7, line 16 ----- -/--	1-3

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents :

<p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent but published on or after the international filing date</p> <p>"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)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"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</p> <p>"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</p> <p>"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</p> <p>"&" document member of the same patent family</p>
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Date of the actual completion of the international search 22 November 2013	Date of mailing of the international search report 18/12/2013
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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 Rodriguez Fontao, M
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INTERNATIONAL SEARCH REPORT

International application No
PCT/BG2013/000030

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE EPODOC [Online] EUROPEAN PATENT OFFICE, THE HAGUE, NL; 31 October 2011 (2011-10-31), KIRILOV PLAMEN P [BG]: "COMPLEX NITROGEN-PHOSPHORUS-POTASSIUM (N-P-K) LIQUID FERTILIZER WITH MICROELEMENTS, METHOD FOR ITS PREPARATION AND APPLICATION", XP002716780, Database accession no. BG-10409900-D cited in the application abstract & BG 104 099 A 31 October 2001 (2001-10-31) -----</p>	1,2

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/BG2013/000030

Patent document cited in search report	Publication date	Patent family member(s)	Publication date	
US 4125393	A	14-11-1978	AU 500251 B2	17-05-1979
			AU 522510 B2	10-06-1982
			BR 7502833 A	16-03-1976
			CA 1075483 A1	15-04-1980
			CA 1086975 A2	07-10-1980
			CS 199267 B2	31-07-1980
			DD 118269 A5	20-02-1976
			DE 2422173 A1	27-11-1975
			HU 177253 B	28-08-1981
			JP S5754473 B2	18-11-1982
			JP S50157160 A	18-12-1975
			MX 4876 E	24-11-1982
			SU 1269732 A3	07-11-1986
			US 4125393 A	14-11-1978
ZA 7502892 A	29-12-1976			
WO 9932419	A1	01-07-1999	AU 1893299 A	12-07-1999
			EP 1042255 A1	11-10-2000
			WO 9932419 A1	01-07-1999
			ZA 9811754 A	28-06-1999