



US00PP11183P

# United States Patent [19]

Izsak et al.

[54] STRAWBERRY PLANT NAMED 'Yael'

[75] Inventors: **Eva Izsak; Shamai Izhar**, both of Rehovot, Israel[73] Assignee: **State of Israel, Ministry of Agriculture, Agricultural Research Organization**, Bet Dagan, Israel[21] Appl. No.: **08/968,823**[22] Filed: **Nov. 14, 1997**[51] Int. Cl.<sup>7</sup> ..... **A01H 5/00**[52] U.S. Cl. ..... **Plt./208**[11] Patent Number: **Plant 11,183**[45] Date of Patent: **Jan. 18, 2000**

[58] Field of Search ..... Plt./48, 49, 208, Plt./209

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[57] **ABSTRACT**

A new and distinct variety of strawberry (*Fragaria L.*) called 'Yael' is a cross between 'Oso Grande' and 'Dorit', and flowers early to medium on a scale of "very early" to "very late".

**2 Drawing Sheets****1****FIELD OF THE INVENTION**

The present invention relates to a new and distinct variety of strawberry (*Fragaria L.*) called 'Yael'.

**BACKGROUND**

This new variety was developed from an organized scientifically designated breeding program, carried out at the Agricultural Research Organization, the Volcani Center, Bet Dagan, Israel. This new variety originated as a single seedling selected from a seedling population obtained from crosses between the strawberry varieties 'Oso Grande' and 'Dorit'. The variety was asexually vegetatively propagated at Bet Dagan, Israel, through runners and the propagation ran true.

**SUMMARY OF THE INVENTION**

The new variety 'Yael' is able to grow in September and produce fruit starting in November and lasting until summer. The production of fruit beginning in November (Northern Hemisphere, latitude 30–33 degrees) is two months earlier than short day varieties of *Fragaria L.* The fruit of the 'Yael' variety is characterized by good taste, good shape and good size.

**BRIEF DESCRIPTION OF THE FIGURES**

FIG. 1: Photograph of the 'Yael' variety, illustrating the fruits.

FIG. 2: Photograph of the 'Yael' variety, illustrating a cross-section of the fruits.

FIG. 3: Photograph of the 'Yael' variety, illustrating the entire plant with foliage, flowers and fruit.

**DETAILED BOTANICAL DESCRIPTION OF THE INVENTION**

The "Yael" variety was grown in winter, under polyethylene tunnels in Israel. 'Yael' is an infra short day variety, which flowers earlier than short day type strawberry varieties. Infra-Short-Day (I.S.D.) varieties are defined as varieties that initiate flower bud primordia under long light regimes of 13–14 hours at the time night temperatures are about 22° C., compared to strawberry varieties classified as short-day or day-neutral, that do not initiate flower bud primordia under above-mentioned conditions, thus resulting in early flowering and fruit production. The plants are grown in polyethylene tunnels to prevent malformation of the fruit

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that can be caused by wind and rain. Flowering and fruit production are not affected by the use of polyethylene tunnels.

This production procedure is utilized in normal agricultural practices by the skilled artisan and does not involve temperature or light control. Plants were stored at 0° C. from January through April. They were then planted in the nursery without further treatment. Runners with plantlets were produced during summer. These young plantlets were collected from the nursery in September and transferred to raised beds. Average temperatures at that time of the year are 30° C. during the day and 22° C. at night. Water and fertilizers were applied through drip irrigation.

An example of an optimum planting date is between September 5 and 15, with the approximate date of flowering on October 1–15, and the approximate date of first fruiting on November 5–15. If planting is September 25–30, the approximate date of fruit flowering is October 25–30, and first fruiting is approximately November 25–30. Flowering is not induced by chilling, but by natural exposure to short day length (long nights) characteristic of late fall and early winter.

Strawberry plants in general are self-fertile, as is 'Yael'; no pollinator is needed as pollination is brought about by insects and wind.

Color readings described herein were taken under natural light conditions and color identifications were made by reference to The Royal Horticultural Society Colour Chart (R.H.S.C.C.) except where common terms of color definition are employed.

The pertinent characteristics of the present invention are presented in Table 1 and Table 2.

Additionally, the variety 'Yael' (1) has no tendency toward fruit malformation; (2) disease resistance appears normal in that no particular problematic conditions arose during trials; and (3) the type of bearing is not remontant, i.e. "Yael" blooms continuously during late fall and winter.

Fruit shape of 'Yael' is similar to the strawberry variety 'Dorit' (U.S. Plant Pat. No. 7,869). The fruit is longer than broad, with primary, secondary and tertiary fruit possessing almost similar shape (Table 2). The fruit is of medium firmness with a red color (Table 2).

The variety 'Yael' flowers two months earlier than known short-day strawberry varieties. A close known variety would be 'Dorit' U.S. Plant Pat. No. 7,869 (Table 1); also see the new varieties mentioned in: U.S. Plant Pat. No. 7,881

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(‘Sharon’); U.S. Plant Pat. No. 7,876 (‘Shalom’); U.S. Plant Pat. No. 7,865 (‘Smadar’); U.S. Plant Pat. No. 8,746 (‘Ofra’); U.S. Plant Pat. No. 8,748 (‘Virginia’); U.S. Plant Pat. No. 8,747 (‘Nama’).

Additionally, early flowering results in early fruit production. Total Soluble Solids (T.S.S), percent acidity, aroma evaluation and taste are presented in Table 4, by comparing to the varieties listed in Table 3.

TABLE 1

PLANT CHARACTERISTICS OF YAEL	
MORPHOLOGICAL TRAIT	DESCRIPTION
Botanical Classification	<i>Fragaria L.</i>
<u>Plant</u>	
1) Height	17–21 cm
2) Diameter	31–35 cm
3) Habit	Globose
4) Density	Dense
5) Vigor	Strong
<u>Leaf:</u>	
1) Length	21–24 cm
2) Width	16–19 cm
3) Green Color of Upper Side	Medium RHS ca. 147 AB
4) Blistering	Medium
5) Cross section	Concave
6) No. of leaflets	Sometimes > 3
<u>Petiole</u>	
1) Length	9–12 cm
2) Thickness	4–6 mm
3) Pubescence	Strong
4) Green Color	Light RHS ca. 144 C
<u>Terminal leaflet</u>	
1) Length/Width ratio	Longer than broad
2) Shape of base	Obtuse
3) Shape of Teeth	Rounded
4) Length	7–8 cm
5) Width	7–8 cm
<u>Calyx</u>	
1) Diameter of Primary Calyx	40–50 mm
2) Diameter of Secondary Calyx	28–38 mm
3) Diameter of Tertiary Calyx	32–35 mm
4) Size of Inner Calyx in relation to Out Calyx	Same size
<u>Flower</u>	
1) Diameter of Primary Flower	25–28 mm
2) Diameter of Secondary Flower	21–26 mm
3) Diameter of Tertiary Flower	20–26 mm
4) Spacing of petals	Touching
5) Petal length	11–12 mm
6) Petal width	10–13 mm
7) Petal length/width	Broader than long
8) Time of beginning of flowering	Early to medium
9) Fragrance	None
<u>Stolon</u>	
1) Number per Plant	ca. 13
2) Thickness	3.5–4 mm
3) Pubescence	Weak
4) Anthocyanin coloration	Strong
<u>Inflorescence</u>	
1) Position relative to foliage	At level with
2) Peduncle length	ca. 10 cm
3) Peduncle thickness	ca. 3 mm
4) Peduncle color	light green RHS ca. 144C
5) Peduncle pubescence	strong

The description of ‘Yael’ is based on the test guidelines for *Fragaria L.* of the International Union for the Protection

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of New Plant Varieties (UPOV). Only characteristics which are relevant for comparing varieties are listed; for example, there are no varietal differences acknowledged in the characteristic “color of lower side of leaf”.

The time of beginning of flowering is scaled as from “very early” to “very late”. “Very early” is defined as approximately the first week of October under the prevailing conditions, while “very late” is defined as approximately the first week of December. ‘Yael’ is scaled as “early to medium”, while ‘Dorit’ is between “very early to early” and “early”, and ‘Oso Grande’ is “late to very late”.

Strawberry plants have dichotome inflorescences, thus producing one primary, two secondary and four tertiary flowers per inflorescence. Flowers of higher order do not normally produce commercial fruit.

TABLE 2

FRUIT CHARACTERISTICS OF YAEL	
CHARACTERISTIC	DESCRIPTION
Time of first ripening	Early to Medium
<u>Primary Fruit</u>	
1) Length	50–56 mm
2) Width	42–55 mm
3) Shape	Conical
4) Weight	ca. 48 g
<u>Secondary Fruit</u>	
1) Length	48–54 mm
2) Width	40–45 mm
3) Shape	Conical
4) Weight	ca. 38 g
<u>Tertiary Fruit</u>	
1) Length	45–53 mm
2) Width	35–40 mm
3) Shape	Conical
4) Weight	ca. 25 g
Band without achenes	narrow
Unevenness of surface	Absent or very weak
Color	Red 45A
Evenness of color	Even
Glossiness	Medium
Insertion of achenes	Bellow surface
Insertion of calyx	In a basin
Pose of calyx segments	Clasping or detached
Size of calyx in relation to fruit diameter	larger
Adherence of calyx	Strong
Firmness	Firm
Color of Flesh	Orange red 43B
Evenness of flesh color	Slightly Uneven
Sweetness	Medium
Acidity	Medium

The time of first ripening, approximately one month after beginning of flowering, is scaled as from “very early” to “very late”. “Very early” is defined as approximately the first week of November, while “very late” is defined as approximately the first week of January. ‘Yael’ is scaled as “early to medium”, while ‘Dorit’ is between “very early to early” and “early”, and ‘Oso Grande’ (U.S. Plant Pat. No. 6,578) is “late to very late”. The shape of ‘Yael’ fruit is similar to that of the variety ‘Dorit’.

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TABLE 3

COMPARATIVE YIELD OF YAEL						
	November	December	January	February	March	April
‘Yael’	30	50	100	120	130	120
‘Dorit’	30	70	100	100	100	100
‘Ofra’	50	60	60	100	100	100
‘Chandler’	0	0	30	150	150	120

Average yield in g/m<sup>2</sup>, in Ramat, Hadar, Israel. The time of beginning of ripening for ‘Yael’ fruit is the end of November. The time of ripening for ‘Ofra’ (infra short day U.S. Plant Pat. No. 8,746) fruit is “very early”. The time of ripening for ‘Dorit’ (infra short day U.S. Plant Pat. No. 7,869) fruit is between “very early to early” and “early”. The time of ripening for ‘Chandler’ (short day U.S. Plant Pat. No. 5,262) fruit is “very late”.

TABLE 4

COMPARATIVE FRUIT CHARACTERISTICS OF YAEL				
	T.S.S. <sup>a</sup>	Acidity <sup>b</sup>	Aroma <sup>c</sup>	Taste
‘Yael’	8.0–9.0	0.9	4	Good
‘Dorit’	8.5–9.5	1.0	5	Good
‘Ofra’	8.0–9.5	1.0	4	Good
‘Chandler’	6.5–7.5	0.8	4	Slightly acidic

<sup>a</sup>Total Soluble Solids (Sugars) expresses fruit sweetness and was determined with a refractometer for strawberry fruit a T.S.S. of 14.0 is very sweet, while below 6.5 is not sweet.

TABLE 4-continued

COMPARATIVE FRUIT CHARACTERISTICS OF YAEL				
	T.S.S. <sup>a</sup>	Acidity <sup>b</sup>	Aroma <sup>c</sup>	Taste
‘Yael’	8.0–9.0	0.9	4	Good
‘Dorit’	8.5–9.5	1.0	5	Good
‘Ofra’	8.0–9.5	1.0	4	Good
‘Chandler’	6.5–7.5	0.8	4	Slightly acidic

<sup>b</sup>Percent of acidity was determined as follows: 2 cc of juice extract was mixed with 20 cc of water. Five drops of phenolphthalein was added and the mixture was titrated with NaOH. The percent acidity is calculated as the quantity of NaOH (cc)  $\times 0.32$ .

<sup>c</sup>The aroma value is a subjective expression obtained by tasting, using a scale from 1 (no aroma) to 5 (strong aroma).

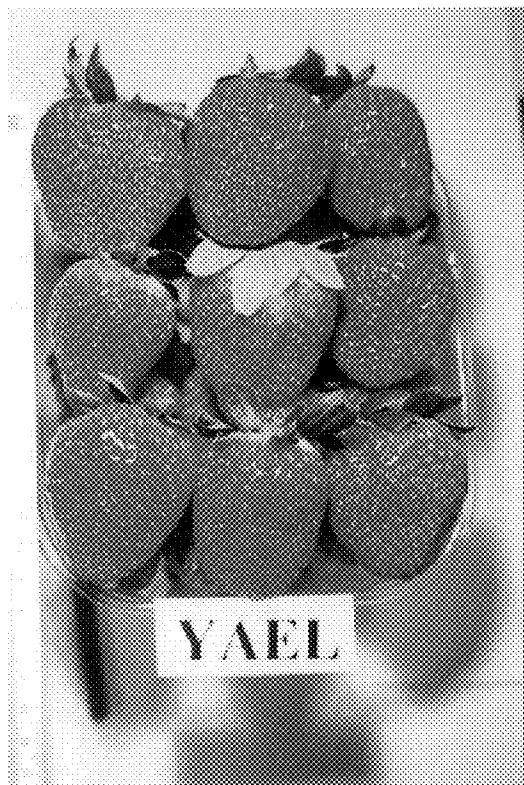
a. Total Soluble Solids (Sugars) expresses fruit sweetness and was determined with a refractometer for strawberry fruit a T.S.S. of 14.0 is very sweet, while below 6.5 is not sweet.

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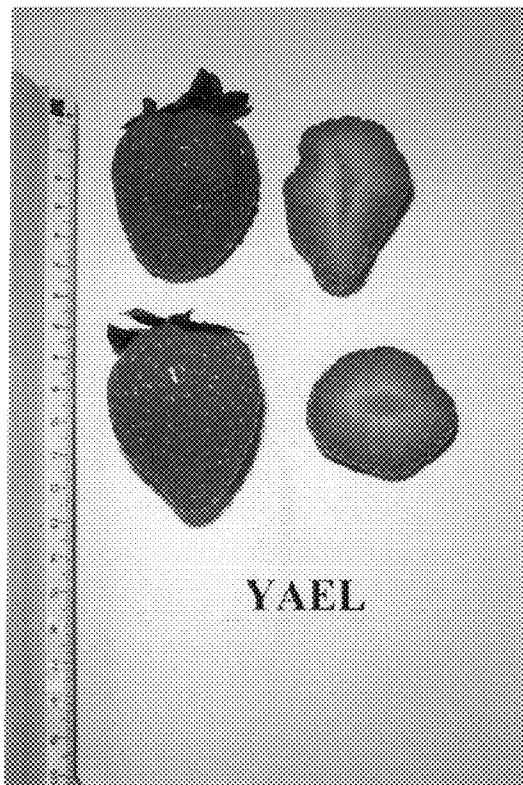
What is claimed is:

1. A new distinct variety of strawberry plant substantially as illustrated and described and distinguished as being able to grow in September and produce fruit starting in November and lasting until summer, with fruit having a good taste and shape.

\* \* \* \* \*



**FIG 1**



**FIG 2**



**FIG 3**