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(12) **United States Plant Patent**
Ackerman et al.

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(54) **STRAWBERRY PLANT NAMED 'PS-5016'**

(50) Latin Name: ***Fragaria ananassa***
Varietal Denomination: **PS-5016**

(75) Inventors: **Stephen M. Ackerman**, Salinas, CA (US); **Steven D. Nelson**, Watsonville, CA (US); **Michael D. Nelson**, Watsonville, CA (US)

(73) Assignees: **Plant Sciences, Inc.**, Watsonville, CA (US); **Berry R&D, Inc.**, Watsonville, CA (US)

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(22) Filed: **Sep. 9, 2005**

(51) **Int. Cl.**
A01H 5/00 (2006.01)

(52) **U.S. Cl.** **Plt./208**
(58) **Field of Classification Search** Plt./208
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

PP9,903	P	*	5/1997	Ackerman et al.	Plt./209
PP10,686	P	*	11/1998	Ackerman et al.	Plt./208
PP10,780	P	*	2/1999	Ackerman et al.	Plt./208
PP11,110	P	*	10/1999	Jamieson et al.	Plt./208

* cited by examiner

Primary Examiner—Wendy Haas
(74) *Attorney, Agent, or Firm*—Foley & Lardner LLP

(57) **ABSTRACT**

This invention relates to a new and distinct short-day variety of strawberry plant named 'PS-5016'. This new strawberry variety 'PS-5016' is primarily adapted to the growing conditions of the central coast of California, and is primarily characterized by its large plant size, vigorous growth rate with flowers visible above the plant for most of the year, large foliage size, light green in color and strongly concave in cross section, highly productive with fruit ripening beginning early, and produced fruit is small in size, medium red in color, conical in shape with excellent firmness, gloss and appearance.

4 Drawing Sheets

Latin name of the genus and species of the plant claimed: *Fragaria ananassa.*
Variety denomination: 'PS-5016'.

BACKGROUND OF THE INVENTION

The present invention relates to a new and distinct short-day strawberry variety designated as 'PS-5016'. This new variety is a result of a controlled cross made by the Inventors, Stephen M. Ackerman, Steven D. Nelson and Michael D. Nelson, in 1997 between strawberry variety designated 'PS-1150' (patented, U.S. Plant Pat. No. 10,780) and strawberry variety designated 'PS-1269' (patented, U.S. Plant Pat. No. 10,686). The variety is botanically known as *Fragria ananassa.*

The seedling resulting from the aforementioned cross was asexually propagated by stolons in a nursery located in Siskiyou County, Calif., and was subsequently selected by the Inventors from a controlled breeding plot near Salinas, Calif., in 1999. After its selection, the new variety was further asexually propagated by stolons in both Siskiyou County, Calif., and San Joaquin County, Calif. The new variety was extensively tested over the next several years in fruiting fields near Salinas, Calif. This propagation has demonstrated that the combination of traits disclosed herein as characterizing the new variety are fixed and remain true to type through successive generations of asexual reproduction.

BRIEF SUMMARY OF THE INVENTION

'PS-5016' is primarily adapted to the climate and growing conditions of the central coast of California. This region

provides the necessary winter temperatures required for it to produce a strong vigorous plant and to remain in fruit production from April through November. The nearby Pacific Ocean provides the needed humidity and moderate temperatures to maintain fruit quality during the spring, summer and fall production months.

The following traits have been repeatedly observed and are determined to be unique characteristics of 'PS-5016', which in combination distinguish this strawberry plant as a new and distinct variety:

1. large plant size;
2. vigorous growth rate with flowers visible above the plant for most of the year;
3. large foliage size, light green in color and strongly concave in cross section;
4. highly productive with fruit ripening beginning early; and
5. produced fruit is small in size, medium red in color conical in shape with excellent firmness, gloss and appearance.

The strawberry varieties that are believed to be most closely related to the new strawberry variety 'PS-5016' are the strawberry variety 'PS-592' (patented, U.S. Plant Pat. No. 9,903) and the parental strawberry variety 'PS-1150'.

In comparison to the similar strawberry varieties 'PS-592' and 'PS-1150', 'PS-5016' differs by the following combination of characteristics as described in Table 1:

TABLE 1

Characteristic	'PS-5016'	'PS-592' (PP9,903)	'PS-1150' (PP10,780)
Plant			
Size	large	large	medium-small
Stolon anthocyanin coloration	medium-strong	medium-weak	medium-strong
Foliage/Petioles			
Leaf color	light green	medium green	medium green
Leaf size	large	large	small
Shape in cross section	slightly-strongly concave	slightly concave	slightly concave-flat
Blistering	medium-strong	medium-strong	medium-weak
Stipule length	medium	long	medium
Fruit			
Size	small	large	small
Flavor	very good	very good	good
Color	red	red-orange red	red
Attitude of calyx segments	spreading-collapsing	spreading-reflexed	spreading-collapsing
Skin firmness	strong	medium	strong
Inflorescences			
Position relative to foliage	above	level with to below	above
Fruiting truss length	long	long	medium
Time of ripening	early	early	late

For identification, a series of molecular markers have been determined for this new variety.

BRIEF DESCRIPTIONS OF THE DRAWINGS

The accompanying color photographs illustrate the overall appearance of typical specimens of the new strawberry variety 'PS-5016' at various stages of development as true as reasonably possible with color reproductions of this type. Color in the photographs may differ slightly from the color value cited in the detailed botanical description which accurately describe the color of 'PS-5016'. The depicted plant and plant parts of the new strawberry variety 'PS-5016' were taken in Salinas, Calif., and are approximately 8 to 9 months old.

FIG. **1** shows typical fruiting field characteristics on Jun. 11, 2004;

FIG. **2** shows a close-up view of a typical mature trifoliate on Jun. 3, 2004;

FIG. **3** shows a close-up view of fruit on Jul. 12, 2004;

FIG. **4** shows typical internal and external fruit characteristics on Jul. 16, 2004; and

FIG. **5** shows typical mature and immature field fruit on Jun. 3, 2004.

DETAILED BOTANICAL DESCRIPTION

'PS-5016' has not been observed under all possible environmental conditions. The characteristics of the new variety may vary in detail, depending upon variations in environmental factors, including weather (temperature, humidity and light intensity), day length, soil type and location.

The aforementioned photographs, together with the following description of the new strawberry variety 'PS-5016', unless otherwise noted, is based on observations taken during the 2004 growing season in Salinas, Calif. These measurements and ratings were taken from plants of 'PS-5016' dug from a high-elevation nursery located in Siskiyou County, Calif., during the middle of October 2003 and planted approximately 3 weeks later in Salinas, Calif. The approximate age of the observed plants is 8 to 9 months. Yield observations and fruit quality characterisitcs are averaged from three years of data collected from the 2002 through the 2004 growing seasons.

Color terminology follows the Munsell Book of Colors, Munsell Color, Baltimore, Md. (1976).

Fruit characteristics: Tables 2, 3 and 4 describe fruit, fruit production and fruit quality characteristics of 'PS-5016'. Fruit characteristics are taken from secondary fruit on a first year planting.

CHART 1

	'Poulpar038'	'Poulra024'
Petal count	35 to 40	31
Flower diameter	65 to 75 mm	45 to 50 mm
General tonality of flower color	Red-Purple N57 B	Red 52 C

c-1:	Ethylene glycol di(meth)acrylate
c-2:	Diethylene glycol di(meth)acrylate
c-3:	Triethylene glycol di(meth)acrylate
c-4:	Polyethylene glycol di(meth)acrylate (number average molecular weight: 150–1000)
c-5:	Propylene glycol glycol di(meth)acrylate
c-6:	Dipropylene glycol di(meth)acrylate
c-7:	Tripropylene glycol di(meth)acrylate
c-8:	Polypropylene glycol di(meth)acrylate (number average molecular weight: 200–1000)
c-9:	Neopentyl glycol di(meth)acrylate
c-10:	1,3-Butanediol glycol di(meth)acrylate
c-11:	1,4-Butanediol glycol di(meth)acrylate
c-12:	1,6-Hexanediol glycol di(meth)acrylate
c-13:	Hydroxypivalic ester neopentyl glycol di(meth)acrylate
c-14:	Bisphenol A glycol di(meth)acrylate
c-15:	Trimethylolpropane tri(meth)acrylate
c-16:	Pentaerythritol tri(meth)acrylate
c-17:	Dipentaerythritol hexa(meth)acrylate
c-18:	Pentaerythritol tetra(meth)acrylate
c-19:	Trimethylolpropane di(meth)acrylate
c-20:	Dipentaerythritol monohydroxypenta(meth)acrylate

TABLE 4

Comparison of secondary fruit characteristics of 'PS-5016', with standards from Salinas, California, Jul. 13, 2004.

Character	'PS-5016'	'PS-592'	'PS-1150'
Munsell Color Range Mature Fruit	7.5R 3/10 to 7.5R 4/10	7.5R 3/12 to 7.5R 4/12	7.5R 4/10 to 7.5R 3/8
Fruit Length mean (cm)	3.9	4.7	4.1
Fruit Width mean (cm)	3.8	4.5	3.8
Fruit Length/ Width Ratio	1.03	1.04	1.09
Calyx Diameter mean (cm)	4.3	4.7	4.4
No. Sepals/Berry	14.7	13.3	12.9

Fruit:

Ratio of length to width.—As long as broad to slightly longer than broad.

Size.—Medium.

Predominant shape.—Conical.

Difference in shapes between primary and secondary fruit.—None to very slight.

Band without achenes.—Absent or very narrow.

Unevenness of surface.—Absent or very weak.

Color of mature fruit.—Red, (7.5R 3/10 to 7.5R 4/10).
Evenness of color.—Even.
Glossiness.—Medium.
Insertion of achenes.—Level with surface.
Insertion of calyx.—In basin to level with.
Attitude of the calyx segments.—Spreading to collapsing.
Size of calyx in relation to fruit diameter.—Slightly larger.
Adherence of calyx (*when fully ripe*).—Strong.
Firmness of skin.—Medium to strong.
Firmness of flesh.—Medium to firm.
Color of flesh.—Medium red (7.5R 4/10 to 7.5R 4/12).
Distribution of red color of the flesh.—Marginal and central.
Hollow center.—Moderately expressed.
Receptacle color.—Whitish (N 9.25/84.2%R to N 9/78.7%R).
Seed color.—Moderate red to moderate yellow (7.5R 3/8 to 5Y 6/8).
Seed size.—Small (average 0.53 mg).
Time of flowering (*50% of plants at first flower*).—Early.
Time of ripening (*50% of plants with ripe fruit*).—Early.
Type of bearing.—Not remontant.

Plant characteristics: Table 5 describes plant characteristics of 'PS-5016'. Plant characteristics are taken from a fully mature mid season plant.

TABLE 1

Characteristic	'Kakegawa S80'	'9B-58C'	'7BC-42A-1'
Flower color	Blue with deep blue veins	Red	Dark orange
Growth habit	Semi-creeping	Semi-creeping	Semi-erect

Plant:

Size.—Large.
Habit.—Globose.
Density.—Medium.
Vigor.—Strong.
Stolons.—Number: Medium to few. Anthocyanin coloration: Weak (7.5R 5/6 to 7.5R 6/6). Thickness: Thin. Pubescence: Medium to strong.

Foliage characteristics: Table 6 describes foliage characteristics of 'PS-5016'. Foliage characteristics are taken from a fully mature tri-foliate during mid season.

TABLE 1

SN.	RADIUS	THICKNESS	GLASS	CLR. AP.
1	100.8190	6.00000	ACRYLIC	107.63
2	48.9744	15.25518		84.97
3a	143.9044	6.00000	ACRYLIC	81.86
4a	43.3618	37.93520		68.93
5a	35.6345	15.00000	STYRENE	54.27
6a	81.6110	17.36272		47.86
7	Aperature stop	7.77990		37.45
8a	−27.2425	6.00000	STYRENE	37.38
9a	−423.3710	0.50000		45.18
10	107.7346	15.00000	SK5	52.75
11	−73.4827	4.00000	SP6	57.31
12	−1002.5660	1.50000		64.58
13	108.4138	23.00000	SK5	80.44
14	−95.4279	0.50000		82.81
15a	133.2972	12.00000	ACRYLIC	84.41
16a	−132.2276	114.48260		83.83
17a	139.3172	15.00000	ACRYLIC	108.80
18a	−700.0000	10.00020		108.50

EVEN POLYNOMIAL ASPHERES

SN.	AD	AE	AF	AG	AH	AI
1	−1.5934E-07	−3.2301E-11	−8.4041E-15	−1.4417E-18	1.0816E-22	2.0851E-25
3	2.0545E-06	−1.5307E-10	1.8192E-13	7.9530E-17	2.8673E-20	1.1986E-23
4	−9.7451E-08	4.9263E-10	−4.9311E-13	2.6150E-16	3.9054E-19	1.2880E-22
5	−2.3574E-07	−1.3342E-09	5.3174E-12	−7.7048E-17	−1.1073E-17	1.2716E-20
6	−8.2802E-07	1.6251E-09	1.1805E-12	−2.0627E-14	5.0501E-17	−3.3873E-20
8	4.4580E-07	−4.4341E-09	1.5629E-11	9.3004E-15	−1.6550E-16	2.5239E-19
9	8.5180E-07	−1.8891E-10	1.2699E-12	5.1184E-16	−2.8733E-18	3.3000E-21
15	−1.6675E-07	8.4927E-11	3.6771E-14	2.5463E-17	−5.0093E-21	−1.1761E-23
16	1.7020E-06	2.7211E-10	3.2080E-14	3.7396E-17	−1.0735E-20	−7.5127E-24
17	−1.8602E-07	5.2861E-11	−2.2361E-14	5.1543E-18	−1.9417E-21	4.4279E-25

SYSTEM FIRST ORDER PROPERTIES

OBJ. HT: −660.40	fl: 2.40	MAG: −0.0800
EFL: 65.6056	FVD: 307.316	ENP: 57.7119
IMD: 10.0002	BRL: 297.316	EXP: −13189.8
OBD: −762.684	OVL: 1070.00	
STOP: 0.00 after surface 7. DIA: 37.446		

Foliage:

Color of upper surface.—Medium green, (7.5GY 3/4 to 7.5GY 3/6).

Color of under side.—Medium grey green, (5GY 5/4 to 5GY 6/4).

Shape in cross section.—Slightly concave to strongly concave.

Blistering.—Medium to strong.

Glossiness.—Medium.

Number of leaflets/leaf.—Three.

Terminal leaflet.—Size: Large. Length/width ratio: As long as broad to longer than broad. Shape of base: Obtuse. Shape of incision of margins: Obtuse.

Petiole.—Pubescence: Moderate.

Anthocyanin coloration of stipule.—Medium.

Attitude of hairs.—Slightly outwards to upwards.

Frequency of bract leaflets.—Some (50–60%).

Flowers and inflorescences: Table 7 describes inflorescence and flower characteristics of 'PS-5016'. Inflorescence characteristics are taken from a fully mature plant while flower characteristics are taken from a secondary flower during mid season.

Inflorescence:

Position relative to foliage.—Above.

Pubescence.—Strong.

Anthocyanins.—Moderate.

Number of bract leaflets.—Bracts occur on about 90% of the inflorescences.

Size of bract leaflets.—Large.

Fruiting truss length.—36.0 cm.

Flowers:

Color.—White (N9.5/90.0%R to N9.25/84.2%R).

Size.—Medium.

Size of calyx relative to corolla.—Larger.

Relative position of petals.—Overlapping.

Petal length/width ratio.—As long as broad to longer than broad.

Pest reactions: This new variety may not be resistant to any of the known insects, diseases or viruses common in California. It is known to be tolerant to the two-spotted spider mite, aphid and flower thrips when treated properly. It is also known to be moderately tolerant to grey fruit mold, yet susceptible to powdery mildew and angular leaf spot. The susceptibility of the new variety to any of the virus complexes of California has not been determined.

TABLE 2

SN.	RADIUS	THICKNESS	GLASS	CLR. AP.
1	158.7994	8.37562	BK7	95.61
2	38.8752	32.61261		69.13
3a	94.7110	12.00000	STYRENE	63.03
4	−203.5070	0.27919		61.22
5a	42.9601	7.44470	ACRYLIC	46.52
6a	29.5212	27.52002		36.41
7a	−29.5212	7.44470	ACRYLIC	38.06
8a	−42.9601	0.27919		47.24
9	−95.0201	4.18781	SF14	52.65
10	153.0600	18.61174	SK5	63.41
11	−40.9609	0.27919		63.59
12a	−1496.9570	15.00000	ACRYLIC	73.63
13	−76.4720	105.36350		76.70
14a	104.2866	18.00000	ACRYLIC	107.94
15	−535.3889	9.99825		107.71

EVEN POLYNOMIAL ASPHERES

SN.	AD	AE	AF	AG	AH	AI
3	1.2971E-06	−1.9595E-10	9.6038E-14	5.3556E-17	−9.0228E-20	1.3068E-22
5	1.8328E-06	−4.7943E-10	1.1410E-11	−1.3831E-14	2.0351E-17	−1.7888E-21
6	2.7335E-06	1.3736E-08	−3.3516E-11	1.0660E-13	−8.6134E-17	2.6188E-19
7	−2.7335E-06	−1.3736E-08	3.3516E-11	−1.0660E-13	8.6134E-17	−2.6188E-19
8	−1.8328E-06	4.7913E-10	−1.1410E-11	1.3831E-14	−2.0351E-17	1.7888E-21
12	−1.7503E-08	−5.9870E-10	5.5361E-13	−1.0091E-16	−2.0521E-19	9.6568E-23
14	−6.5592E-07	−3.0849E-10	3.2824E-13	−1.1758E-16	1.9238E-20	−1.1976E-24

SYSTEM FIRST ORDER PROPERTIES

OBJ. HT: −660.40	fl: 2.40	MAG: −0.0800
EFL: 65.9995	FVD: 267.397	ENP: 47.5474
IMD: 9.99825	BRL: 257.398	EXP: 933.924
OBD: −772.750	OVL: 1040.15	
STOP: 13.76 after surface 6. DIA: 34.222		

We claim:

1. A new and distinct strawberry plant named 'PS-5016', as herein described and illustrated by the characteristics set forth above.

* * * * *

FIGURE 1

FIGURE 2

FIGURE 3

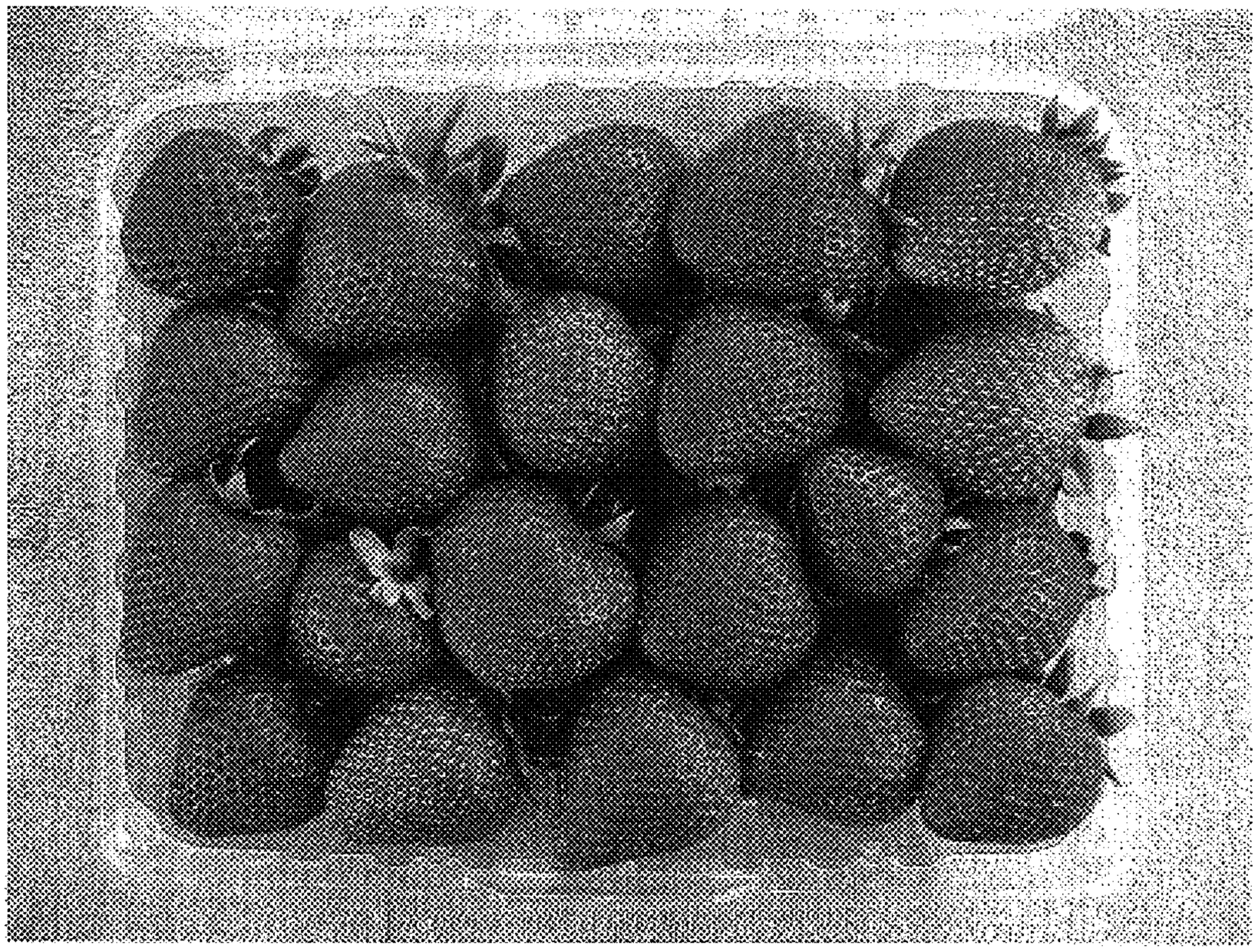

FIGURE 4

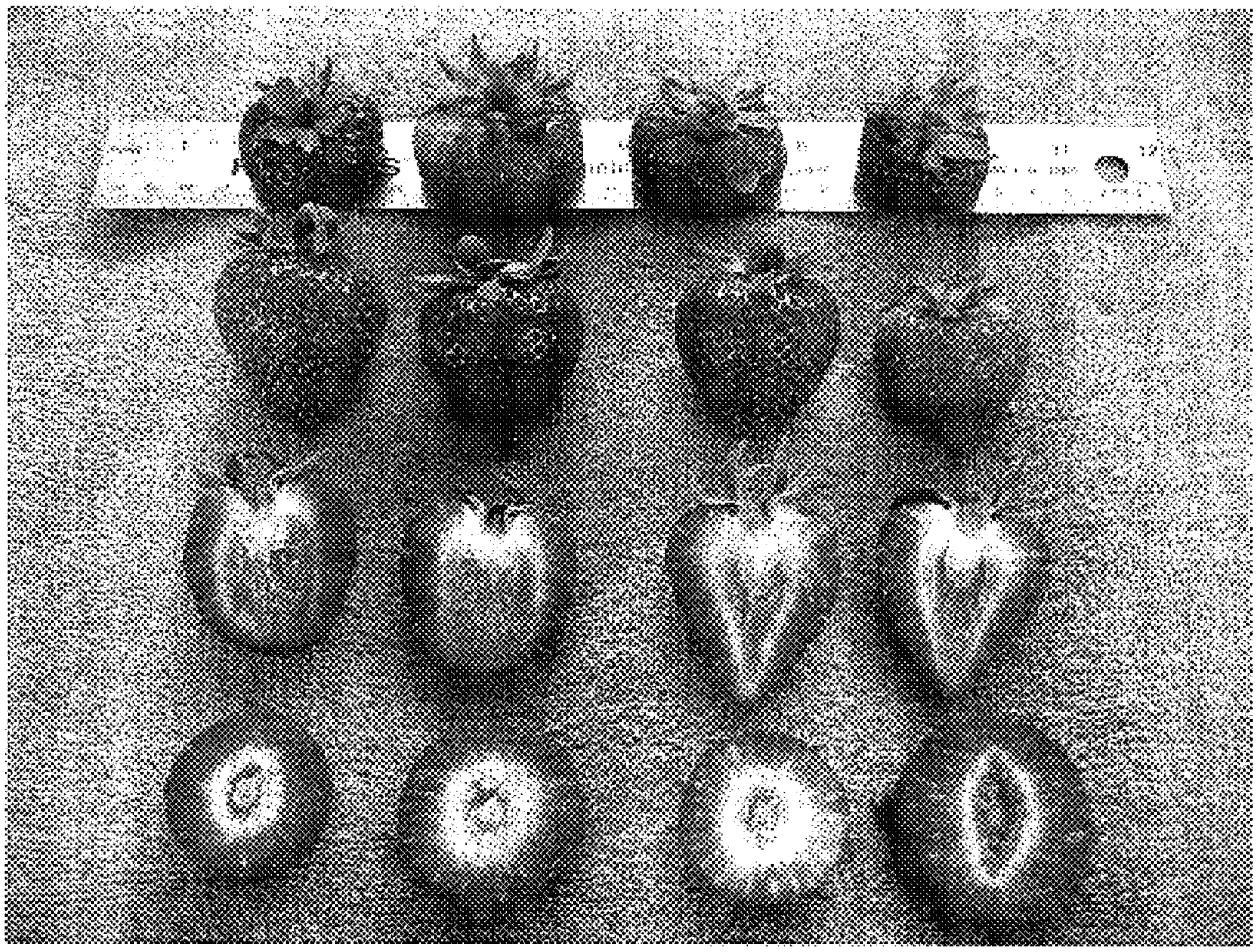

FIGURE 5