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United States Patent [19]**Izhar et al.**[11] **Patent Number:** **Plant 8,746**[45] **Date of Patent:** **May 24, 1994**[54] **STRAWBERRY PLANT OFRA**[75] **Inventors:** **Shamay Izhar; Eva Izsak**, both of Rehovot, Israel[73] **Assignee:** **The Volcani Center, State of Israel, Ministry of Agriculture, Bet Dagan, Israel**[21] **Appl. No.:** **823,638**[22] **Filed:** **Jan. 22, 1992**[51] **Int. Cl.⁵** **A01H 5/00**[52] **U.S. Cl.** **Plt./49**[58] **Field of Search** **Plt. 48, 49**[56] **References Cited****U.S. PATENT DOCUMENTS**

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Primary Examiner—James R. Feyrer

Attorney, Agent, or Firm—Pennie & Edmonds

[57] **ABSTRACT**

A new and distinct variety of strawberry (*Fragaria L.*) called "Ofra" is disclosed. The variety is a cross between "Parker" and "111", which results in a variety that flowers several months earlier than most other known strawberry varieties.

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

The present invention relates to a new and distinct variety of strawberry (*Fragaria L.*) called "Ofra". The variety was developed from an organized scientifically designated breeding program carried out at the Agricultural Research Organization, the Volcani Center, Bet Dagan, Israel. The variety is the product of selection of seedlings resulting from crosses between the strawberry varieties "Parker" and "111". The variety was asexually vegetatively propagated through runners and the reproduction ran true.

SUMMARY OF THE INVENTION

The new variety "Ofra" is able to grow in September and produce fruit starting in November and lasting until summer. The production of fruit beginning in November is two months earlier than short-day strawberry varieties and within a similar time frame of strawberry varieties "Shalom" (U.S. Plant Pat. No. 7,876), "Sma-dar" (U.S. Plant Pat. No. 7,865), "Saa'id" (U.S. Plant Pat. No. 7,870), "Dorit" (U.S. Plant Pat. No. 7,869) "Sharon" (U.S. Plant Pat. No. 7,881). The fruit of the "Ofra" variety is characterized by good taste, good shape and size as well as a long shelf life.

2**BRIEF DESCRIPTION OF THE FIGURES**

FIG. 1.—Photograph of the "Ofra" variety illustrating the fruit.

FIG. 2.—Photograph of the "Ofra" variety illustrating a cross-section of the fruit.

FIG. 3.—Photograph of the "Ofra" variety illustrating the entire plant with foliage, flowers and fruit.

DETAILED BOTANICAL DESCRIPTION OF THE INVENTION

The "Ofra" variety was grown in winter under polyethylene tunnels in Israel. "Ofra" is an infra short-day strawberry variety. Infra short-day varieties are induced to initiate flower bud primordia in response to relatively long light regimes (but under short-day conditions) and are relatively insensitive to night temperatures. Flowering and fruit production is not affected by the use of polyethylene wind tunnels. This production procedure is utilized in normal agricultural practices by the skilled artisan and does not involve temperature or light control. Mother 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 August 25 and September 5 with the approximate date of flowering on October 1–10 and the approximate date of first fruiting on November 1–10. “Ofra” flowering is not induced by chilling, but by natural exposure to shortening day length. Color readings described herein were taken under natural light conditions and color identifications were made by reference to The Royal Horticultural Society Colour Chart (RHSCC) 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 “Ofra” (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 (e.g., “Ofra” blooms perpetuously, during late fall and winter).

The fruit is longer than broad, with first order and second order fruit possessing distinct shapes (Table 2). The fruit is very firm with an orange-red color (Table 2).

The variety “Ofra” flowers several months earlier than known strawberry varieties. One of the closest known varieties would be “Karina” (Table 1), and the new varieties mentioned supra; e.g., U.S. Plant Pat. No. 7,881 (“Sharon”), U.S. Plant Pat. No. 7,876 (“Shalom”), U.S. Plant Pat. No. 7,865 (“Smadar”), U.S. Plant Pat. No. 7,870 (“Saaid”) and U.S. Plant Pat. No. 7,869 (“Dorit”). Additionally, early flowering results in early fruit production for “Ofra” and the two varieties, “Virginia”, subject of a U.S. Plant patent application Ser. No. 07/823,802, filed Jan. 22, 1992, and “Nama”, subject of U.S. Plant patent application Ser. No. 07/823,721, filed Jan. 22, 1992. Total Soluble Solids (TSS), marketable appearance, fruit color, sepal appearance, firmness, pressure defects and general health are presented in Table 3 by comparison to the co-pending varieties as well as the short-day variety, “Douglas” (U.S. Plant Pat. No. 4,487).

TABLE 1

PLANT CHARACTERISTICS OF “OFRA”		
MORPHOLOGICAL TRAIT	DESCRIPTION ^a	COMPARABLE VARIETY ^b
Classification	Botanical-Fragaria L.	
Plant habit	Flat-Globose	“Sengana”
Plant density	Medium	“Gorella”
Plant vigor	Strong	“Grande”
Plant diameter	160–220 mm	
Plant height	80–90 mm	
<u>Leaf:</u>		
a) Length	120–190 mm	
b) Width	100–150 mm	
c) Color		
1) Upper Side:	Medium Green	
d) Blistering	Weak	
e) Cross-section	Concave	
f) # of leaflets	Sometimes > 3	
<u>Terminal leaflet</u>		
a) Length/Width ratio	As long as broad	
b) Shape of base	Obtuse	
c) Shape of teeth	Obtuse	
d) Length	60–75 mm	
e) Width	60–75 mm	

TABLE 1-continued

PLANT CHARACTERISTICS OF “OFRA”		
MORPHOLOGICAL TRAIT	DESCRIPTION ^a	COMPARABLE VARIETY ^b
<u>Flower</u>		
a) Size	Medium	“Gorella”
b) Size of calyx to corolla	Similar	
c) Size of inner calyx versus outer calyx	Larger	
d) Spacing of petals	Overlapping	
e) Diameter		
1) First order	32 mm	
2) Second order	28 mm	
f) Petal length/width	Nearly as broad as long	
1) length	12–13 mm	
2) width	14–15 mm	
g) Time of flowering	Very early	“Karina” ^c
<u>Stolon</u>		
a) Number	Many	“Gorella” ^d
b) Thickness	Thick	
c) Anthocyanin coloration	Weak	
<u>Petiole</u>		
a) Pose of hairs	Outwards	
b) Length	55–90 mm	
<u>Fruiting Truss:</u>		
Attitude	Prostrate	
Stipule: Anthocyanin Coloration	Medium	
<u>Inflorescence</u>		
a) Position relative to foliage	Above	

^aThe description of “Ofra” is based on the test guidelines for *Fragaria* L. of the International Union for the Protection of New Plant Varieties, (UPOV).

^bOnly 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”.

^c“Ofra” flowers at the end of October. One of the earliest known varieties for comparison is “Karina”, which flowers in January. Additionally, “Ofra” flowers within approximately the time range as strawberry varieties “Shalom” (U.S. Plant Pat. No. 7876), “Smadar” (U.S. Plant Pat. No. 7,865, “Saaid” (U.S. Plant Pat. No. 7,870, “Dorit” (U.S. Plant Pat. No. 7,869, in U.S. Plant Pat. Application Ser. No. 07/823,802, filed Jan. 22, 1992, and U.S. Plant Pat. Application Ser. No. 07/823,721, filed Jan. 22, 1992, respectively.

^d“Ofra” still produces more runners than the comparable variety, “Gorella”.

TABLE 2

FRUIT CHARACTERISTICS OF “OFRA”	
CHARACTERISTICS	DESCRIPTION
<u>Time of ripening</u>	
Ratio of length/maximum width	Very Early
Size	Longer than broad
First Order	Large
a) Predominant Shape	Wedges
b) Length	45–55 mm
c) Width	30–40 mm
d) Thickness	22–30 mm
e) Weight	27 g
<u>Second Order</u>	
a) Predominant Shape	Conical
b) Length	45–50 mm
c) Width	25–30 mm
d) Thickness	23–28 mm
<u>Difference in Shape Between First Order and Second Order Fruit</u>	
Band without achenes	Marked
Unevenness of surface	Narrow or Medium
Color	Absent or Very weak
Evenness of color	Red
Glassiness	Even
Insertion of achenes	Strong
Insertion of calyx	Below surface
Pose of calyx segments	Set above fruit
Size of calyx in relation to fruit diameter	Reflexed
Adherence of calyx	Same size
Firmness	Very strong
Color of flesh	Very firm
Evenness of flesh color	Orange-red
	Slightly uneven

TABLE 3

COMPARATIVE SHELF-LIFE AND FLAVOR OF "OFRA"								
Variety	Percentage		Firmness ^a		Se-	Fruit color ^c	Mar-	Sugar content T.S.S. ^e
	Health	Pres- sure de- fects	Vis- ual	New- ton units	pal		ket- able	
					ap- pear- ance ^b		ap- pear- ance ^d	
First test: at harvest date								
Variety	Percentage		Firmness ^a		Se-	Fruit color ^c	Mar-	Sugar content T.S.S. ^e
	Health	Pres- sure de- fects	Vis- ual	New- ton units	pal		ket- able	
					ap- pear- ance ^b		ap- pear- ance ^d	
Ofra	100	0	5	6.0	5	4.0	4.5	9.6
Vir- ginia ^f	100	0	5	4.2	5	3.5	4.0	8.5
Na- ma ^g	100	0	5	3.7	5	3.5	4.0	8.0
Douglas ^h	100	0	5	3.7	5	4.5	4.0	6.5
Second test:								
After 3 days of storage at 2° C.								
Ofra	92	8	4.0	6.0	4	4.2	4.4	
Vir- ginia	80	20	3.5	3.5	4	4.2	3.8	
Na- ma	78	22	3.5	3.0	4	4.0	3.7	

TABLE 3-continued

COMPARATIVE SHELF-LIFE AND FLAVOR OF "OFRA"								
Douglas								
5	76	24	3.7	3.5	4	5.0	3.7	
Third test:								
		Percentage		Se-		Mar-		
		Pres-	Firmness ^a		pal	ket-		
10		sure	New-		ap-	Fruit	ap-	Sugar
Vari-		de-	Vis-	ton	pear-	co-	pear-	content
ety	Health	fects	ual	units	ance ^b	lor ^c	ance ^d	T.S.S. ^e
after 3 days storage at 2° C. plus								
2 additional days at simulated shelf temperature of 18° C.								
15	Ofra	55	45	3.5	5.5	3.2	4.5	3.5
	Vir-	50	50	3.0	2.8	3.0	4.5	3.2
	ginia							
	Na-	44	56	3.0	3.0	3.0	4.5	3.0
	ma							
	Douglas							
20		45	55	3.0	3.0	3.2	5.0	3.2
INDEX:								
^a 5-hard 1-soft								
^b 5-green, fresh like, 1-dry, brown								
^c 5-dark red, 1-green, pink								
^d 5-prime 1-not marketable								
^e Total Soluble Solids (T.S.S.) expresses fruit sweetness and was determined with a refractometer								
25	^f U.S. Plant Pat. Application Ser. No. 07/823,802, January 22, 1992.							
^g U.S. Plant Pat. Application Ser. No. 07/823,721, January 22, 1992.								
^h U.S. Plant Pat. No. 4,487								

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 and a long shelf life.

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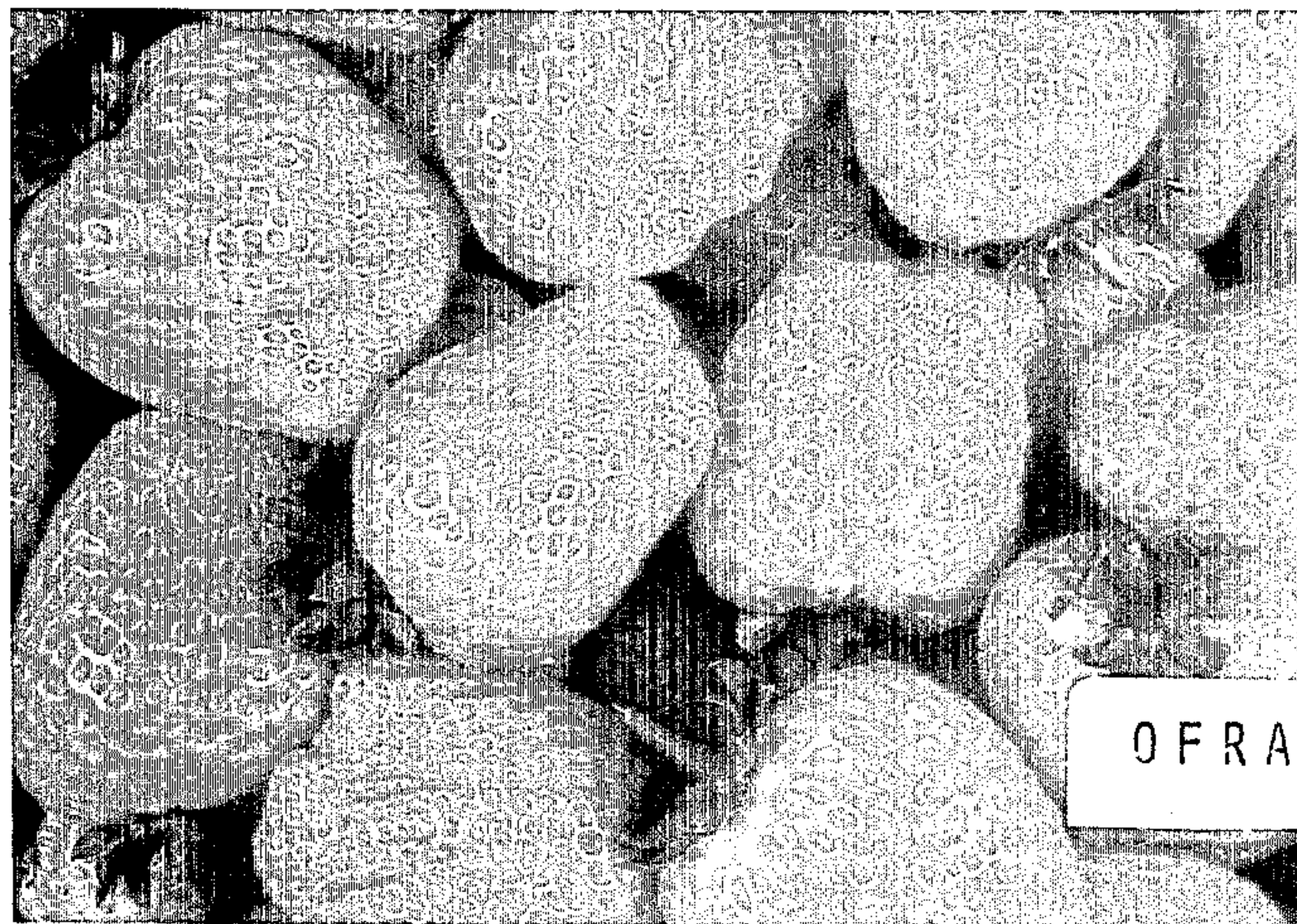


FIG. 1

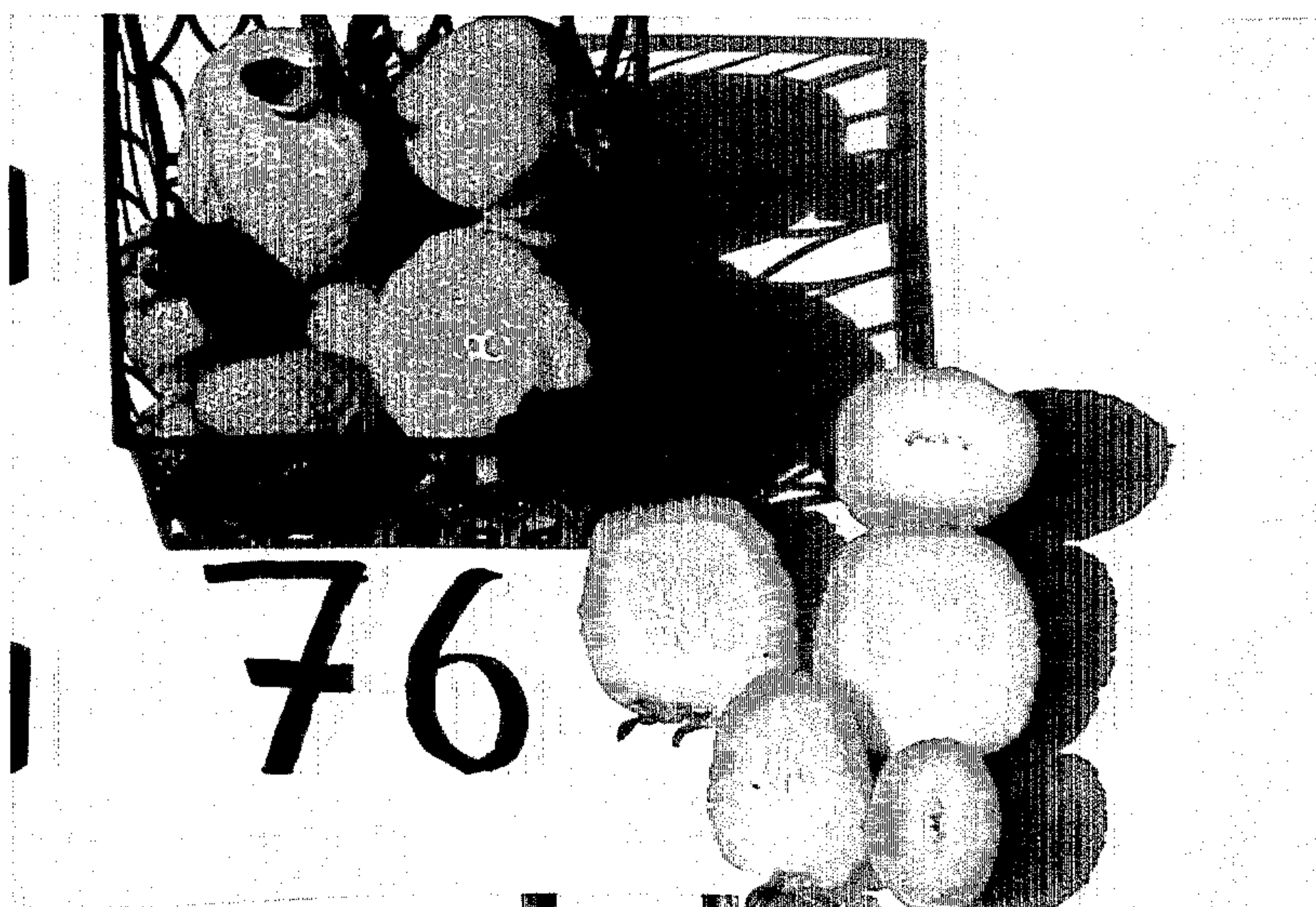


FIG. 2

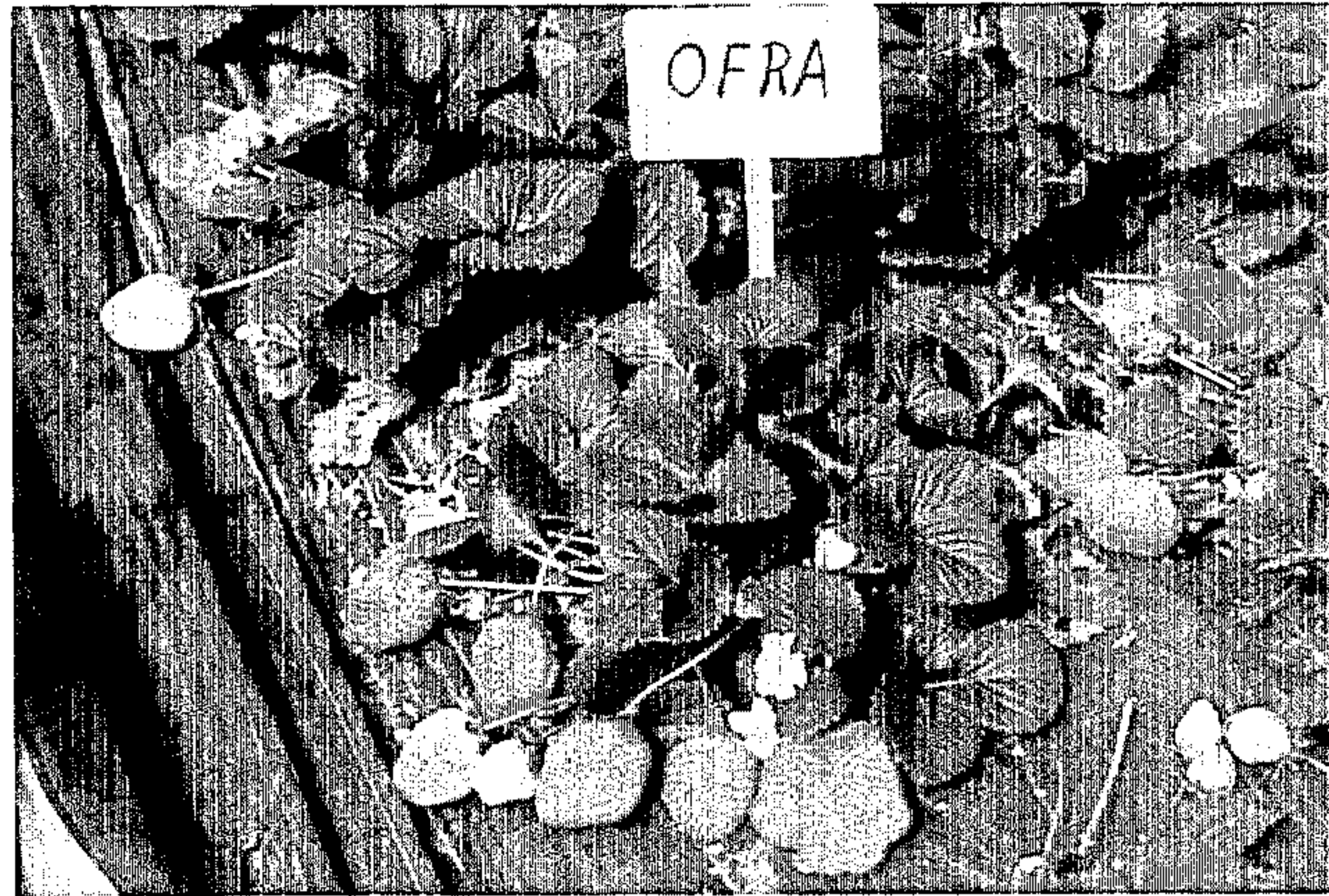


FIG. 3