

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

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(54) **CHESTNUT PLANT NAMED ‘AU PREMIER’**

(50) Latin Name: *Castanea seguinii*
Varietal Denomination: **AU Premier**

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patent is extended or adjusted under 35
U.S.C. 154(b) by 0 days.

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

(52) **U.S. Cl.** **Plt./152**

(58) **Field of Classification Search** Plt./152
See application file for complete search history.

(56) **References Cited**

PUBLICATIONS

Lin ye ji et al., “Forest Science & Technology”, Jan. 1989,
pp. 16–18, Baker Auxiliary Stacks SDI. L56, No. 2–1990.
Crane, H.L. et al., Nut Breeding’, U.S. Dept. of Agriculture
Yearbook, Jan. 1937, pp. 827–837.

Hemming E. Sam, “Chinese Chestnut in Maryland”, Jan.
1944, pp. 32–34, A.R. Northern Nut Growers Assoc.

Kim, Kap Duk et al., Studies on the Farmers Cultivating
Chestnut Orchards in Kores and Its Financial Analysis, Jan.
1971, pp. 51–74, Bull. Seol. Nut. Univ.Fores., No. 8.

Snare, Lester, Chestnuts Production, Jan. 1996, pp.
422–427, NSW Agriculture, Agfact H3.1.50., <http://www.r-irdc.gov.au/pub/handbook/chestnuts.pdf>.

Harris, Hubert et al., Three Chinese Chestnuts: AU Cropper,
AU-Leadder, and AU-Homestead—Their History And Pro-
duction, Mar. 1980, pp. 3–8, Agricultural Experiment Sta-
tion Auburn University Circular 247.

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(57) **ABSTRACT**

The disease resistant ‘AU Premier’ seguin offers food avail-
ability for wildlife over an extended period. A single plant
drops nuts for a 2–3 month period. Nut size varies with
season and the average weight is between 1 and 1.5 grams.
The plant does not bloom until mid-May, therefore late
spring frosts do not damage the flowers. In most seasons, the
‘AU Premier’ seguin cultivar will have 2–3 flushes of vegeta-
tive growth. The nut quality is similar to the Chinese chest-
nut in that it is high in starch and sugar (40–42%) and low in
fats. ‘AU Premier’ seguin begins to drop its crop of medium
sized nuts about September 8 and nut drop continues until
mid-November. ‘AU Premier’ seguin is an excellent com-
panion cultivar for ‘AU Encore’ seguin since the major nut
drop for ‘AU Premier’ seguin occurs before the major nut
drop period of ‘AU Encore’ seguin.

11 Drawing Sheets

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Latin name of the genus and species of the plant claimed:
Castanea seguinii.
Variety denomination: ‘AU Premier’.

BACKGROUND OF THE INVENTION

A Chinese chestnut planting was established at Auburn
University, Auburn, Ala., from nuts collected in Hubei
Province, P.R. China. Plants were grown in containers under
sprinkler irrigation at the main campus and selection were
made for dwarfism, precocity, cold hardiness, everbearing,
productivity, nut size and quality.

SUMMARY OF THE INVENTION

The present invention relates to a new and distinct sequin
dwarf chestnut cultivar that is precocious, produces a heavy
crop annually, begins nut drop about September 8 and con-
tinues through mid-November. The small nut size (1.3 g) and
continuous nut drop over an extended time makes the ‘AU
Premier’ seguin an ideal high energy food for wildlife. The
sequin nut size is ideal for consumption by quail and turkey.
It produces nuts the year of establishment. The nuts are
medium sized seguin chestnut and not as large as Chinese

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chestnuts. The majority of the nuts from ‘AU Premier’
sequin drop before the majority of the nuts from ‘AU
Encore’ Seguin drop. The ‘AU Premier’ and the ‘AU Encore’
sequins are excellent companion cultivars as they both drop
nuts over an extended period but the major nut drop period
of the cultivars do not overlap. The plant is not affected by
chestnut gall wasp, chestnut blight or leaf spot. ‘AU Encore’
is disclosed in U.S. patent application Ser. No. 12/012,017,
filed on Jan. 30, 2008, and entitled “CHESTNUT PLANT
NAMED ‘AU Encore’”, which is hereby incorporated by
reference.

The new cultivar is able to be asexually reproduced by
budding or grafting onto a seguin seedling rootstock. The
unique characteristics come true to form and are established
and transmitted through succeeding asexual propagation.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a photograph of a branch of a young tree of the
‘AU Premier’ cultivar.

FIG. 2 is a photograph of a branch of a young tree of the
‘AU Premier’ cultivar.

FIG. 3 is a photograph of a young tree of the 'AU Premier' cultivar.

FIG. 4 is a photograph of a young tree with an open bur showing nuts of the 'AU Premier' cultivar.

FIG. 5 is a photograph of a tree in bloom of the 'AU Premier' cultivar.

FIG. 6 is a photograph of a bloom on a shoot of the 'AU Premier' cultivar.

FIG. 7 is a photograph of a branch of a tree of the 'AU Premier' cultivar.

FIG. 8 is a photograph of a tree of the 'AU Premier' cultivar.

FIG. 9 is a photograph of nuts of the 'AU Premier' cultivar.

FIG. 10 is a photograph of nuts of the 'AU Premier' cultivar.

FIG. 11 is a photograph of nuts of the 'AU Premier' cultivar and the 'AU Encore' cultivar.

DETAILED BOTANICAL DESCRIPTION

Seguin chestnut, also spelled "sequin," is one of two chestnut species, *Castanea mollissima* and *C. seguinii*, native to China. It grows as a bush or small tree and is commonly found throughout southeastern and central China. Seguin chestnut is a temperate species and its nature range extends from the Changjiang River region and southeastern China, northward to the southern Hubei province, southward to Guangdong province and westward to Sichuan and Guangxi provinces, a region whose climate is similar to that of the southeastern U.S.A. The plant bears three nuts per bur and the nut size is small (0.5–3 g). It has remained as a noncultivated species in China. The wildy grown nuts and wood are normally harvested by local farmers for food and fuel. The natural range of *C. seguinii* largely overlaps that of *C. mollissima* in southeastern and central China. Natural hybridization is able to occur and morphologically distinguishing *C. mollissima* from *seguinni* has proven difficult in natural forests. One leaf trait, pubescence on the underside of the leaves, has been studied and used for species identification. Scale-like glandular trichomes are able to be observed on the underside of seguin chestnut leaves with a 10× hand lens, while the underside of Chinese chestnut leaves are pubescent. Despite many efforts to use seguin as a dwarfing rootstock for commercial Chinese chestnut cultivars, it has not been successful due to the complete graft incompatibility between these two species.

Precocity. The plants normally flower at 2–15 months of age after seed germination. It is not unusual for plants to flower as early as three weeks. More than 90% of seedlings produced nuts in the first growing season in Alabama when seeds, introduced from China, were planted. Sprouts resulting from cold damage, pruning or other plant injury bear fruit the first year of development. Plants growing in containers that had the top portion of the plant killed during a snow storm had sprouts develop from the root system and produced a crop of nuts. In China, the species is subjected to yearly coppicing in most mountain areas for firewood on which local farmers depend as fuel. The cut off plants develop sprouts from the stump or root system when growth starts in the spring and produces a crop of nuts the same year. 'AU Premier' produces nuts the first growing season and on multiple vegetative flushes each season and has not exhibited any signs of cold injury.

Everbearing. The continuous flowering throughout the growing season described as 'everbearing' is an important characteristic of seguin chestnut. Twenty percent of plants of

two populations collected in Hubei, China, developed bisexual catkins at each new node throughout the growing season. The remaining 80% of the plants were sequential flowering in that the plants produce a set of male and bisexual flowers, after an interval of vegetative growth, a set of flowers develop with each new flush of growth.

'AU Premier' develops bisexual catkins at each node through the growing season. The first burs mature and start dropping nuts during the first to second week of September and nuts continue dropping through early November. The first bloom occurs in mid-May each season.

The species is resistant to *Cryphonectria parasitica*, a casual agent of chestnut blight. Seguin is generally considered less susceptible to the chestnut gall wasp (*Dryocosmus kuriphilus* Yasumatsu) than the Chinese chestnut because of its growing and flowering habits. No gall wasp damage has been detected on 'AU Premier' or any other seguin selections in Auburn tests even though some Chinese chestnut cultivars growing in the same orchard exhibited gall wasp damage.

Some of the original seedlings had a leaf spot problem caused by *Colletotrichum gloeosporioides*. Infected and defoliated plants were discarded during the recurrent selection program. Leaf spot has not been observed on 'AU Premier'.

The table below illustrates the specific differences between the 'AU Premier' cultivar and the 'Revival' cultivar.

The botanical details of this new and distinctive variety of chestnut tree with color definitions (except those in common color terms) referenced to Royal Horticultural Society's Colour Chart (RHS) and color was also determined using an electronic spectrophotometer to determine hue angle and chroma (spectrophotometer model CM-2002; Minolta Camera Co., Japan).
'AU PREMIER' CHESTNUT

Tree:

Size (at maturity) - small
Height 5.8 meters, canopy width 5.4 meters, canopy area 29.17 sq. meters
Vigor - vigorous

Trunk:

Form - trunk upright, tree shape broadly oval; branches low and dense, spreading.
Texture - relatively smooth
Color of bark - Greyed-green, RHS 197A, Chroma C* 15.77, hue angle 89.54

Branches:

Form - strong
Texture - relatively smooth
Lenticels - few, small
Branching habit - low, dense and spreading.
Color - new wood: brown, RHS N200A, Chroma C* 11.48, hue angle 72.68; mature wood: greyed-green, RHS 197A, Chroma C* 10.92, hue angle 85.69

Foliage:

Quantity - abundant
Density - dense

Leaves:

Size - small. Length (cm) 18.1 (14.1-20.7) [20]
width (cm) 5.1 (4.1-6.6) [20]
leaf ratio 3.6 (2.6-4.4) [20]
Shape - lance-oblong to narrowly elliptic
leaf tip - acuminate to occasionally acute
leaf base- cuneate; oblique
Thickness - thin. Leaf venation 1° pinnate: 2° ± parallel, not prominent abaxially
Texture -smooth weakly coriaceous (thin)

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Margin - coarsely serrate, ascending teeth Petiole - shoot length (cm) 0.6 (0.4-1.0) [20] Petiole pubescence- glabrous occasionally sparse simple hairs Color - adaxial surface, glabrous blade, glabrous veins, medium green moderately shiny, RHS 147A Chroma C* 11.06, hue angle 117.41 abaxial surface - small scale-like trichomes on blade, concentrated along midrib, sparse simple hairs on main veins light to medium green, RHS 147B, Chroma C* 21.28, hue angle 104.11 <u>Bloom:</u> Amount of bloom - heavy, at each node on current growth Color - at anthesis, RHS 161D greyed-yellow group, 157D green-white group, 155C white group Blooming period - late, full bloom mid-May. Age at which tree starts flowering - early, first year Male flower - Catkin length (cm) - 11.5 (8.0-14.0) [15] Male flower - stamen number per catkin - 12.1 (9-15) [20] Female flower - flower number per bur - 3.0 Female flower - style number per flower 8.3 (6-10) [20] <u>Crop:</u> Bearing - annual, very precocious Productivity - prolific Ripening period - early September-mid November Distribution of nuts on tree - well distributed, chain of burs on all new vegetative growth Tenacity - burs open while on tree and nuts are easily released and fall. <u>Hull:</u> Description - spiny, round bur, average spine length 11.4 mm Size - (mm) average length 38.7, width 31.5, depth 29.6 Number of nuts - normally 3 per bur Dehiscence - splits easily and opens wide while still on tree and after nuts drop the bur is shed Color - yellow-green at dehiscence, RHS N144C <u>Nut:</u> Size - small; average size (mm) - height 14.7, width 15.5; average weight 1.26 g, average number nuts per pound - 360.3 Form - usually 2 or 3 in a bur, flattened on 1 or 2 sides, mostly; hemispherical in shape, narrowing to an abrupt acute point. Blossom end - little or no tip, distal ⅓ to ¼ end of nut, small fine white hairs exhibited. Basal end - flattened, pubescence-short fine hairs at the tips only Color - lustrous; brown to red brown, RHS 200B, Chroma C* 12.83, hue angle 36.80 Shell - thin Hardness of shell - relatively hard, yet not rigid Texture of shell - smooth Percentage of kernel to nut - high-90% shell out <u>Kernel:</u> Size - almost as large as nut size Form - same as nut shape Pellicle - thin brown Flavor - excellent, very sweet Color - greyed-yellow-RHS 162A, Chroma C* 47.95, hue angle 79.38 Resistance to insects: no insect susceptibilities noted due to bloom period and development, appears to be resistant to gall wasp damage Resistance to disease: resistant to chestnut blight (<i>Cryphonectria parasitica</i>) and leaf spot (<i>Colletrichum gloesporioides</i>) The seguin tree and its nuts herein described may vary in slight detail due to climatic and soil conditions under which the variety may be grown, the present description being of the variety as grown in Camp Hill, Ala. <div>The botanical details of this variety of chestnut tree - with color definitions (except those in common color terms) referenced to Maerz and Paul Dictionary of Color - are as follows: ‘REVIVAL’</div>
Tree:
Size (at maturity) - large Vigor - very vigorous

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<u>Trunk:</u> Form - upright with branches spreading in upper reaches of tree. Texture - relatively smooth Color of bark - Silvergray (13-A-1) <u>Branches:</u> Form - strong Texture - relatively smooth Lenticels - few, small Branching habit - spreading in upper region of tree Color - new wood: reddish brown and glossy, mature wood: silver gray <u>Foliage:</u> Quantity - abundant Density - dense <u>Leaves:</u> Size - large. Average length - 5-7" (including petiole). Average width - 2" Shape - oblong with acute tip and rounded base Thickness - thick Texture - smooth Margin - dentate Petiole - length: medium. Thickness medium. Color - Top side - glossy dark green (22-L-12). Under side - lighter green (21-D-7). <u>Bloom:</u> Amount of bloom - heavy Color - cream white (17-B-1) Blooming period - late. After leaf out in April Age at which tree starts flowering - early; 2-3 years years after graft replacement <u>Crop:</u> Bearing - regular (yearly) bearer Productivity - prolific Ripening period - short. September 15-October 1. Distribution of nuts on tree - well distributed Tenacity - burrs crack while on tree and nuts easily release, many falling by themselves <u>Hull:</u> Description - spiny, round burr Size - 3-4" in diameter Number of nuts - 2-3 per burr Dehiscence - splits easily when still on tree. Some entire burrs split and fall to ground Color - brown (15-A-8) <u>Nut:</u> Size - large. Average size - 1 ⅞" × 1 ⅞" × 1" thick. Average weight - 24-32 nuts per pound Form - broad and ovoid on one side, flat on other side Blossom end - pointed tip Basal end - flattened Color - India Red (7-L-6). Shell - thin Hardness of shell - relatively hard, yet not rigid Texture of shell - smooth Percentage of kernel to fruit - very high (95%) <u>Kernel:</u> Size - almost as large as nut size Form - same as nut shape Pellicle - thin Flavor - excellent. Very sweet. Color - Oyster white (10-B-1) Resistance to insects: no unusual susceptibilities noted Resistance to disease: very high inherent resistance to chestnut bark fungus (<i>Endothia parasitica</i>), no other susceptibilities to any other disease The chestnut tree and its nuts herein described may vary in slight detail due to climatic and soil conditions under which the variety may be grown; the present

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description being of the variety as grown in Alachua,
Fla.

‘AU Buck I’ is different from ‘AU Premier’ in several ways. For example, the trees, the trunk colors, the branch colors, the leaves, the crop and the nuts have differences. Specifically, the ‘AU Buck I’ tree is taller with a canopy width and canopy area larger than the ‘AU Premier’ tree. The ‘AU Buck I’ has a grey-brown trunk, and the ‘AU Premier’ has a greyed-green trunk. The ‘AU Buck I’ branches are grey-brown; whereas, the ‘AU Premier’ branches are brown (new) or greyed-green (mature). The leaves differ in size, shape, thickness, texture, margin, petiole and color. The ripening period for the ‘AU Buck I’ is around August 28, but the ‘AU Premier’ ripening period is early September through mid-November. The average weight of the nuts of ‘AU Buck I’ is 9.3 grams versus 1.26 grams for ‘AU Premier’. Furthermore, ‘AU Buck I’ has roughly 49 nuts per pound, and ‘AU Premier’ has roughly 360.3 nuts per pound.

‘AU Buck II’ is different from ‘AU Premier’ in several ways. For example, the trees, the trunk colors, the branch colors, the leaves, the crop and the nuts have differences. Specifically, the ‘AU Buck II’ tree is taller with a canopy width and canopy area larger than the ‘AU Premier’ tree. The ‘AU Buck II’ has a grey-brown trunk, and the ‘AU Premier’ has a greyed-green trunk. The ‘AU Buck II’ branches are brown (new) or grey-brown (mature); whereas, the ‘AU Premier’ branches are brown (new) or greyed-green (mature). The leaves differ in size, shape, thickness, texture, margin, petiole and color. The ripening period for the ‘AU Buck II’ is around September 14, and the ‘AU Premier’ ripening period is early September through mid-November. The average weight of the nuts of ‘AU Buck II’ is 16.6 grams versus 1.26 grams for ‘AU Premier’. Furthermore, ‘AU Buck II’ has roughly 27 nuts per pound, and ‘AU Premier’ has roughly 360.3 nuts per pound.

‘AU Buck III’ is different from ‘AU Premier’ in several ways. For example, the trees, the trunk colors, the branch colors, the leaves, the crop and the nuts have differences. Specifically, the ‘AU Buck III’ tree is taller with a canopy width and canopy area larger than the ‘AU Premier’ tree. The ‘AU Buck III’ has a brown trunk, and the ‘AU Premier’ has a greyed-green trunk. The ‘AU Buck III’ branches are brown (new) or grey-brown (mature); whereas, the ‘AU Premier’ branches are brown (new) or greyed-green (mature). The leaves differ in size, shape, thickness, texture, petiole and color. The ripening period for the ‘AU Buck III’ is around September 25, and the ‘AU Premier’ ripening period is early September through mid-November. The average weight of the nuts of ‘AU Buck III’ is 10.9 grams versus 1.26 grams for

‘AU Premier’. Furthermore, ‘AU Buck III’ has roughly 42 nuts per pound, and ‘AU Premier’ has roughly 360.3 nuts per pound.

‘AU Buck IV’ is different from ‘AU Premier’ in several ways. For example, the trees, the trunk colors, the branch colors, the leaves, the crop and the nuts have differences. Specifically, the ‘AU Buck IV’ tree is taller with a canopy width larger than the ‘AU Premier’ tree. The ‘AU Buck IV’ has a brown trunk, and the ‘AU Premier’ has a greyed-green trunk. The ‘AU Buck IV’ branches are grey-brown (new) or greyed-green (mature); whereas, the ‘AU Premier’ branches are brown (new) or greyed-green (mature). The leaves differ in size, shape, thickness, texture, margin and color. The ripening period for the ‘AU Buck IV’ is around October 10, and the ‘AU Premier’ ripening period is early September through mid-November. The average weight of the nuts of ‘AU Buck IV’ is 15.5 grams versus 1.26 grams for ‘AU Premier’. Furthermore, ‘AU Buck IV’ has roughly 29 nuts per pound, and ‘AU Premier’ has roughly 360.3 nuts per pound.

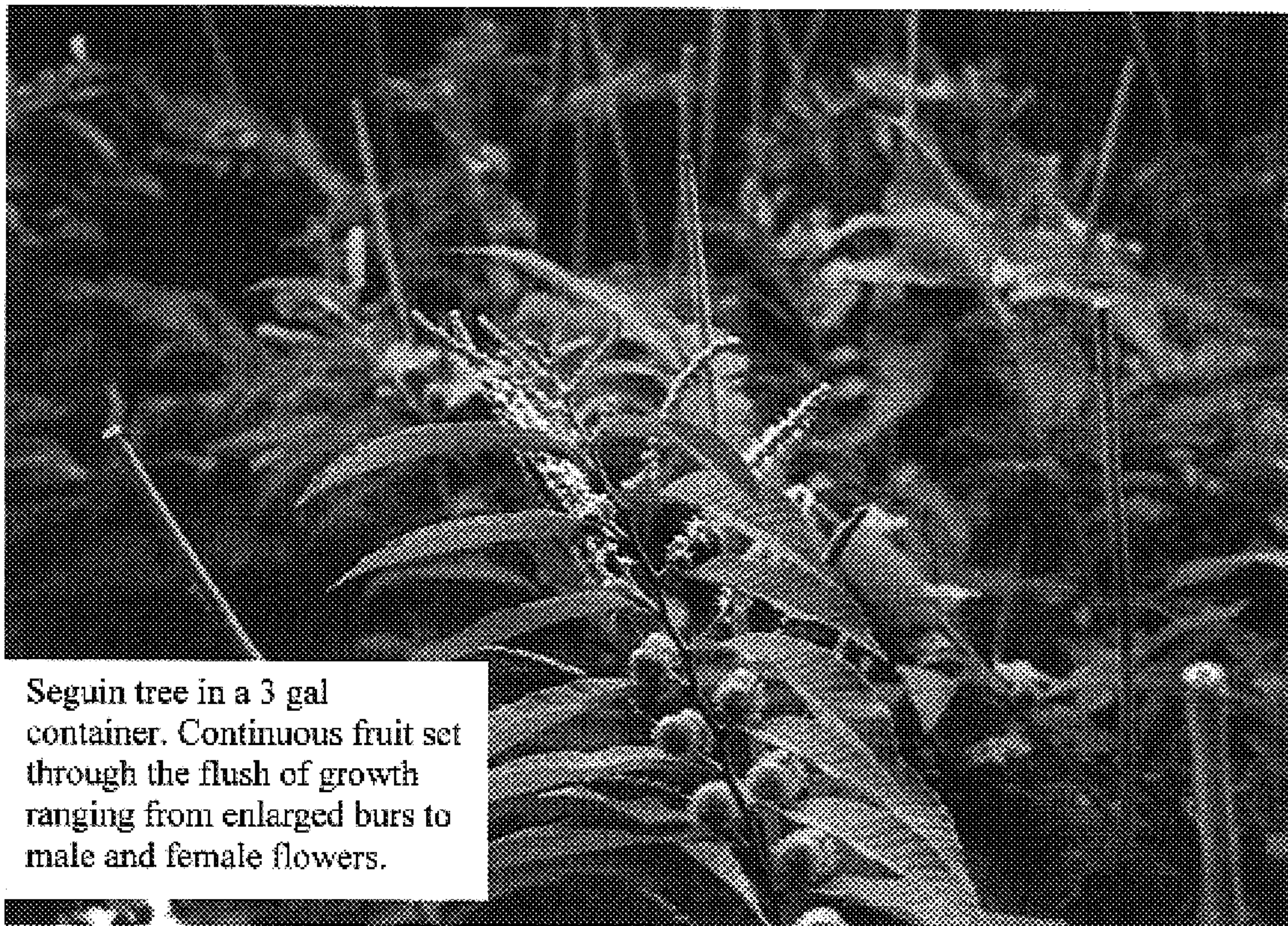
‘AU Gobbler I’ is different from ‘AU Premier’ in several ways. For example, the trees, the branches, the leaves, the crop and the nuts have differences. Specifically, the ‘AU Gobbler I’ tree is taller with a canopy width larger than the ‘AU Premier’ tree. The ‘AU Gobbler I’ branches are upright and high/diffuse; whereas, the ‘AU Premier’ branches are strong and low/dense/spreading. The leaves differ in size, shape, thickness, texture, margin and color. The ripening period for the ‘AU Gobbler I’ is around August 25 and continues for a 4–5 week period, and the ‘AU Premier’ ripening period is early September through mid-November. The average weight of the nuts of ‘AU Gobbler I’ is 7.7 grams versus 1.26 grams for ‘AU Premier’. Furthermore, ‘AU Gobbler I’ has roughly 59 nuts per pound, and ‘AU Premier’ has roughly 360.3 nuts per pound.

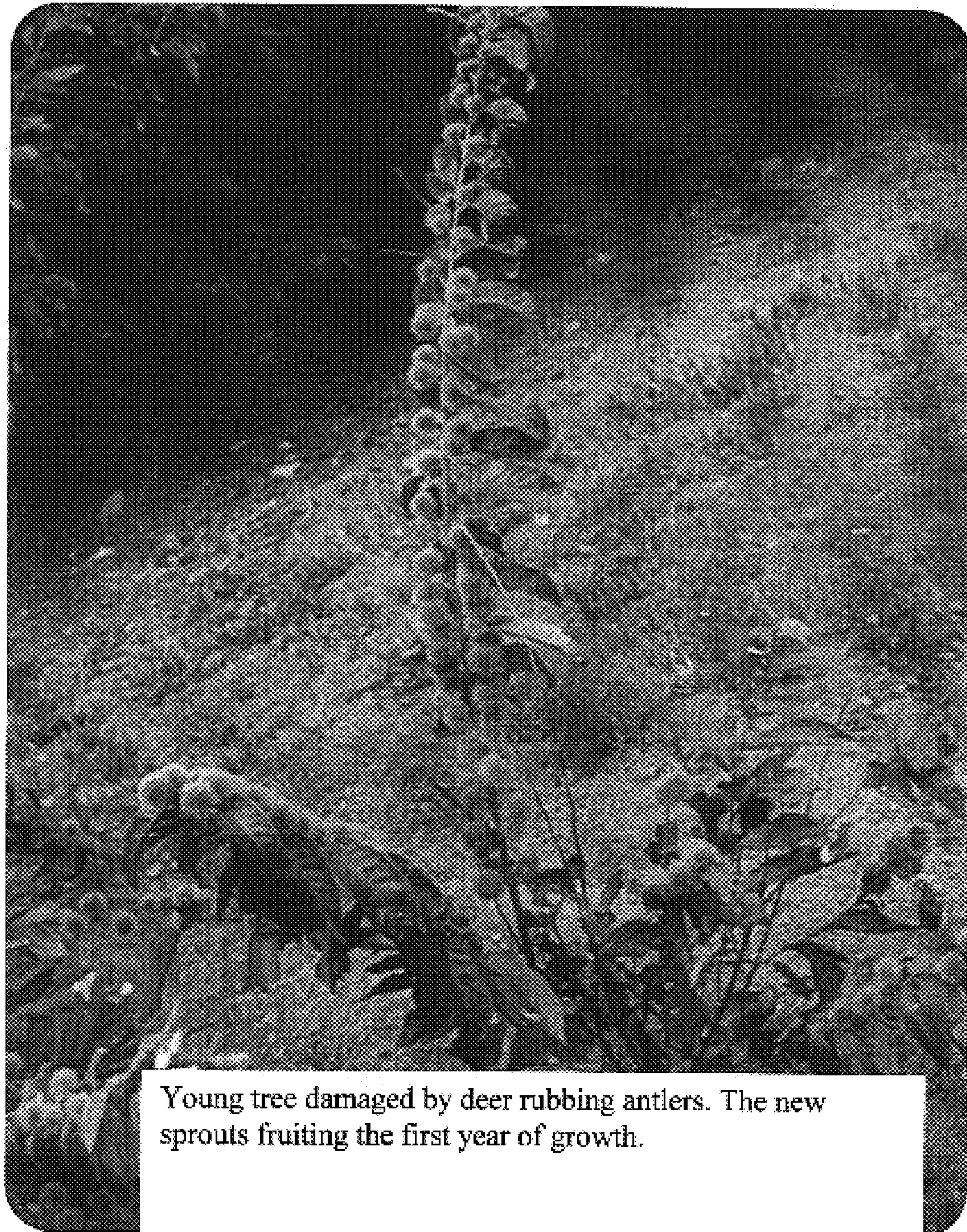
‘AU Gobbler II’ is different from ‘AU Premier’ in several ways. For example, the trees, the branches, the leaves, the crop and the nuts have differences. Specifically, the ‘AU Gobbler II’ tree is taller with a canopy width larger than the ‘AU Premier’ tree. The ‘AU Gobbler II’ branches are spreading; whereas, the ‘AU Premier’ branches are strong. The leaves differ in size, shape, thickness, texture, margin and color. The ripening period for the ‘AU Gobbler II’ is around September 5 and continues for a 4–5 week period, and the ‘AU Premier’ ripening period is early September through mid-November. The average weight of the nuts of ‘AU Gobbler II’ is 5.7 grams versus 1.26 grams for ‘AU Premier’. Furthermore, ‘AU Gobbler II’ has roughly 65–101 nuts per pound, and ‘AU Premier’ has roughly 360.3 nuts per pound.

What is claimed is:

1. A new and distinct cultivar of the species *Castanea seguinii* named ‘AU Premier’ as described and illustrated herein.

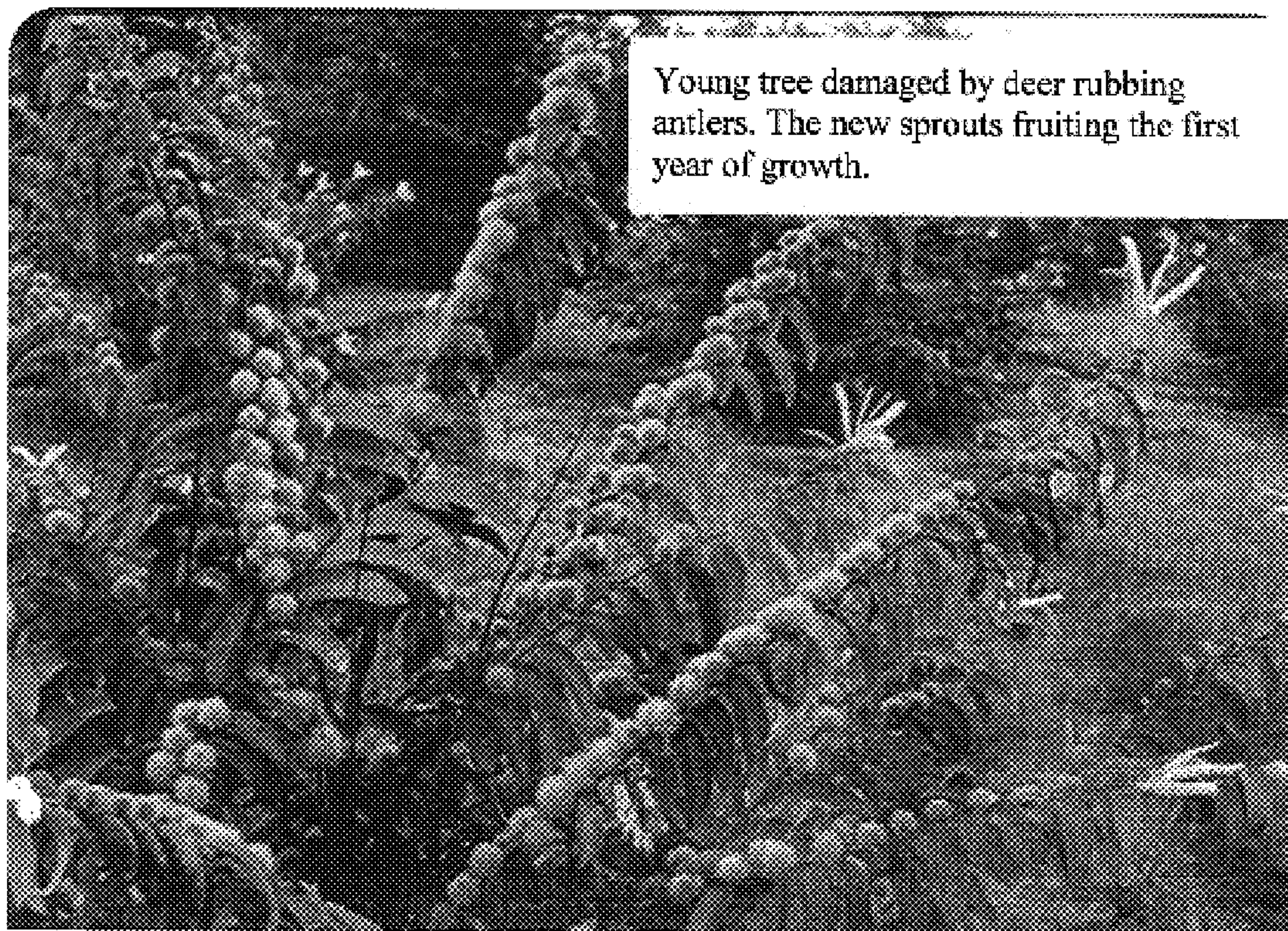
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**Fig. 1**



Young tree damaged by deer rubbing antlers. The new sprouts fruiting the first year of growth.

Fig. 2

**Fig. 3**



Fruiting of seguin first year of growth.

Fig. 4

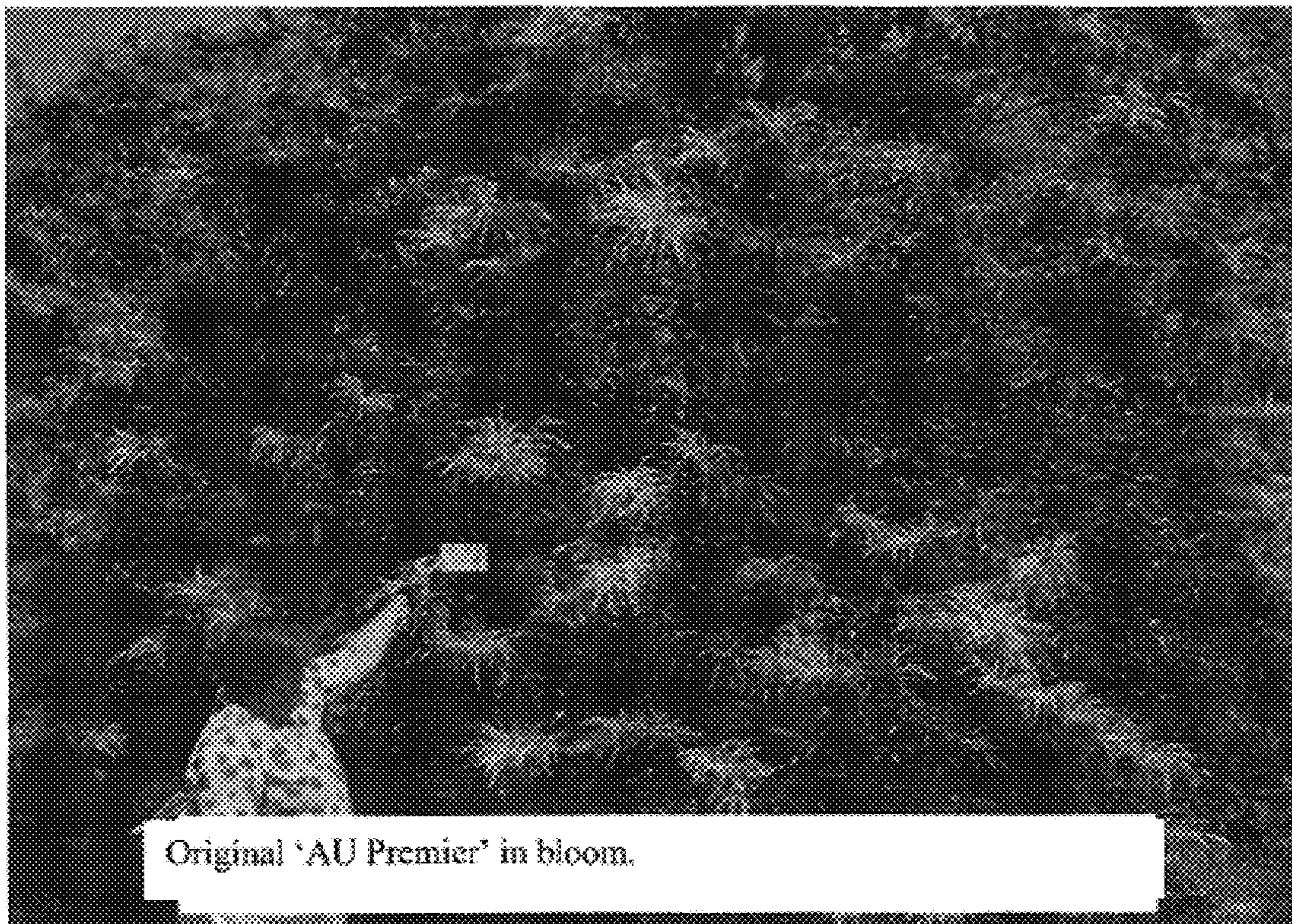


Fig. 5

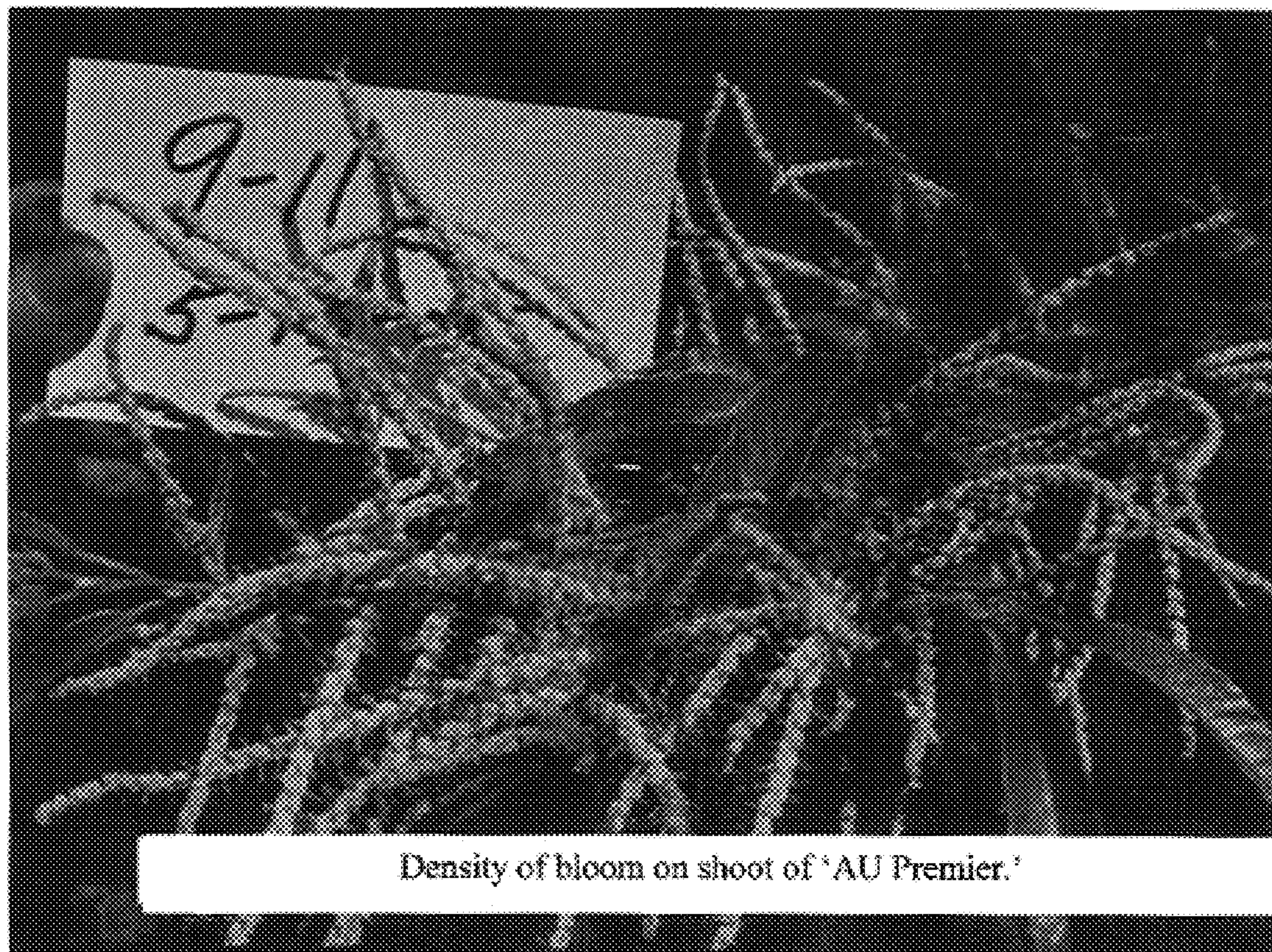
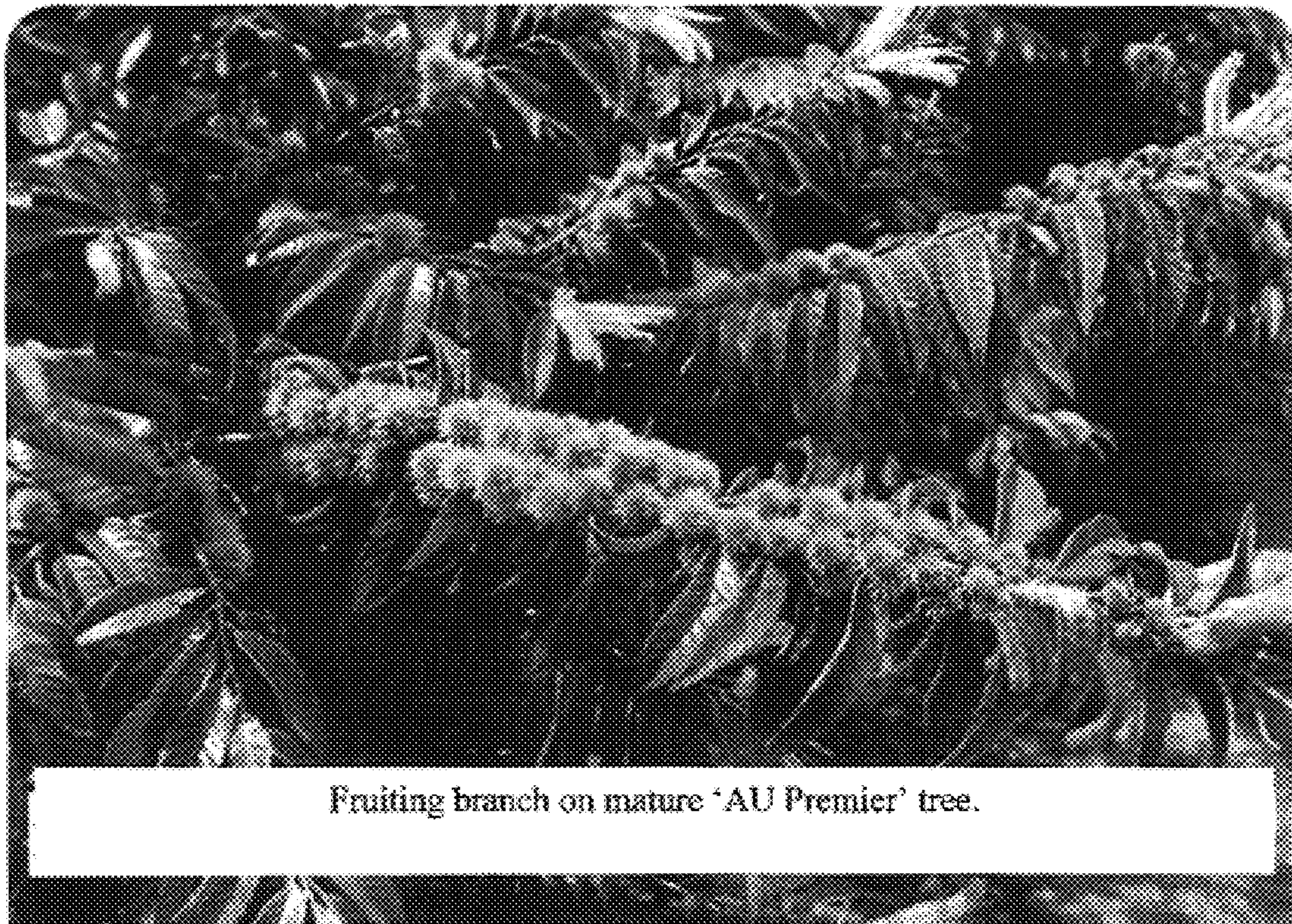
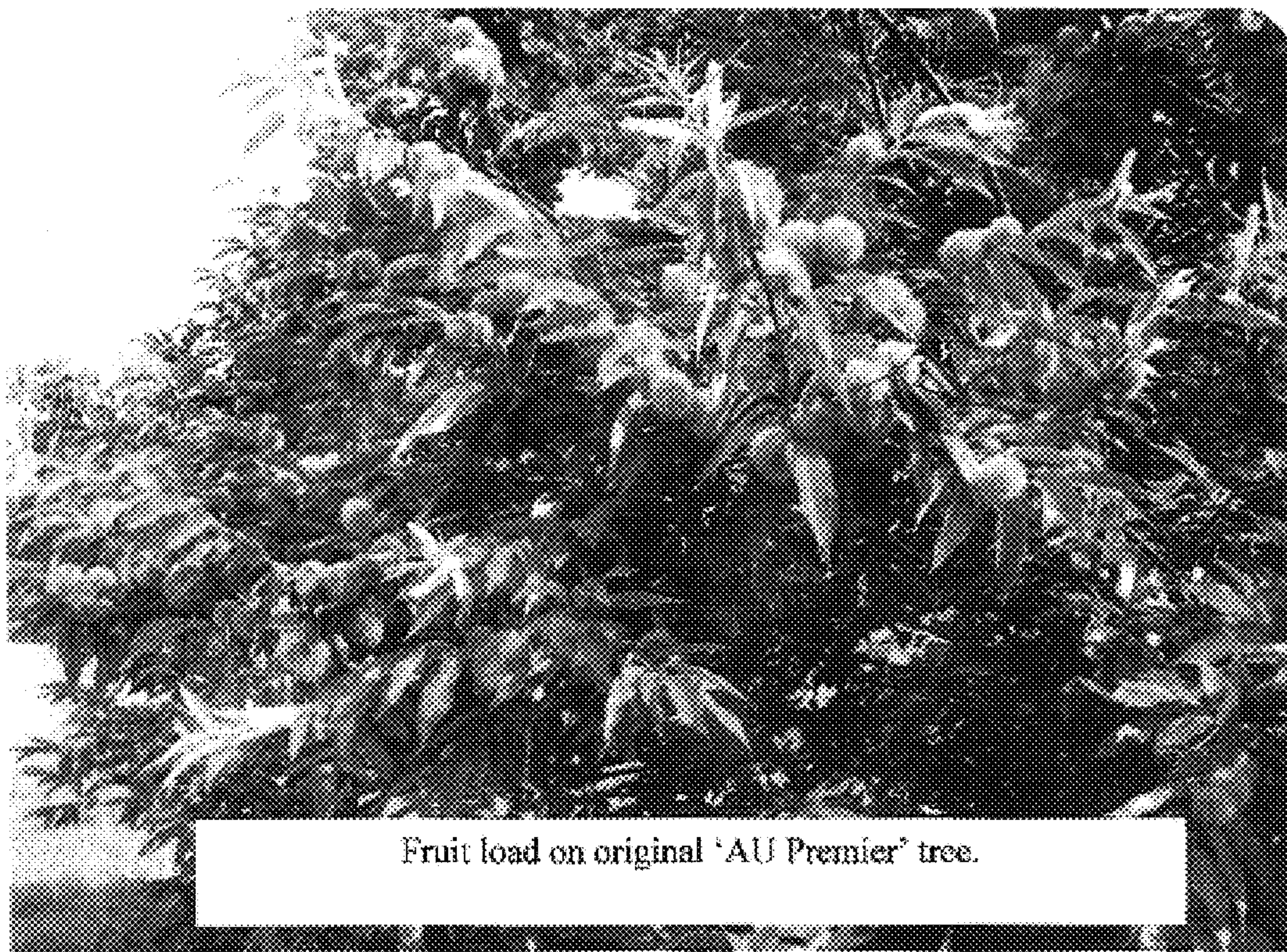


Fig. 6



Fruiting branch on mature 'AU Premier' tree.

Fig. 7



Fruit load on original 'AU Premier' tree.

Fig. 8

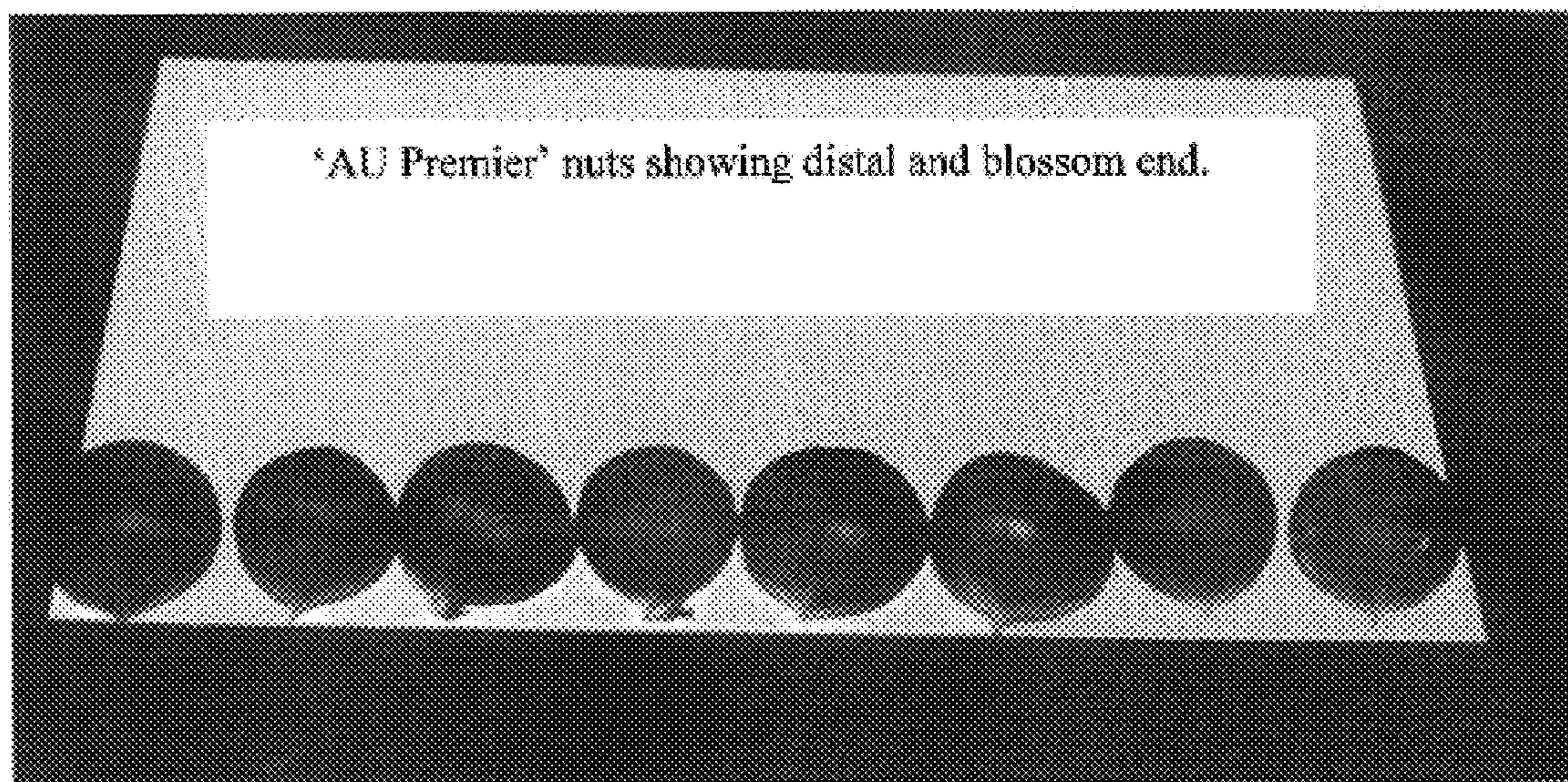


Fig. 9

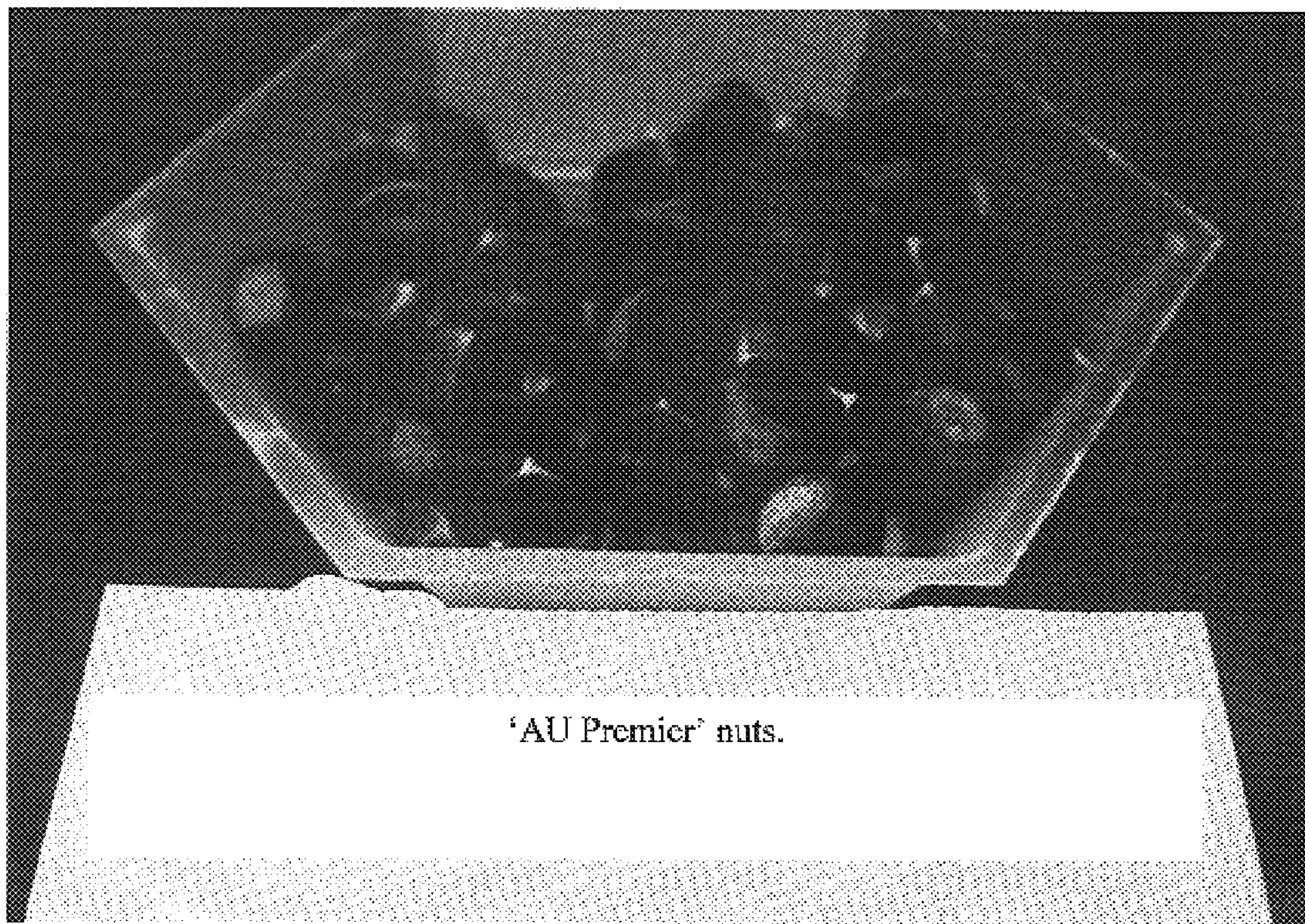
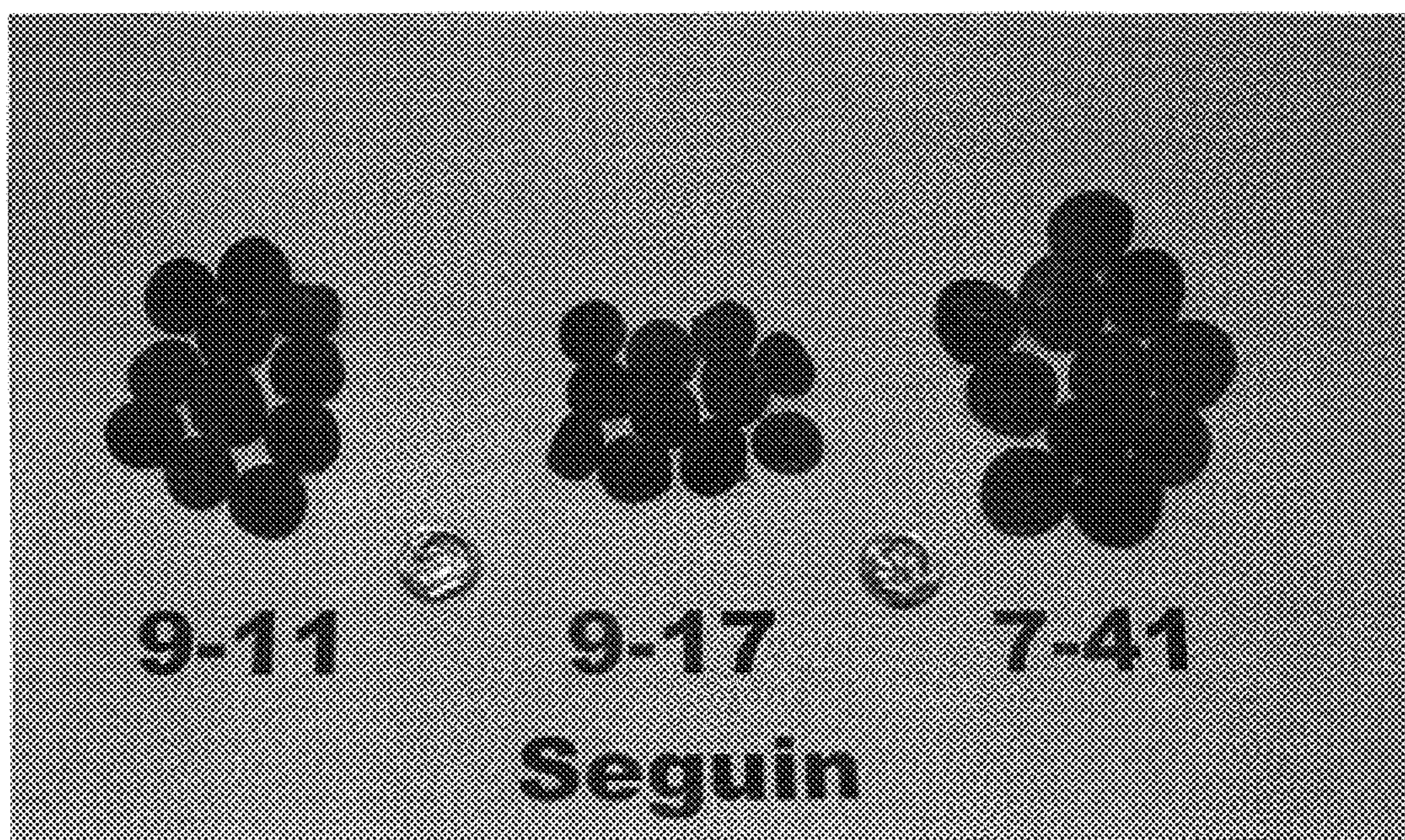


Fig. 10



Comparison of 'AU Premier' (9-11) and 'AU Encore' (7-41) nuts.

Fig. 11