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Wirthensohn et al.

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(54) **ALMOND VARIETY NAMED 'MAXIMA'**

(50) Latin Name: ***Prunus dulcis***
Varietal Denomination: **'MAXIMA'**

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See application file for complete search history.

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(57) **ABSTRACT**

A new and distinct almond variety of *Prunus dulcis* named 'MAXIMA', particularly characterized by large kernels and very high production. Other desirable characteristics include early to medium harvest time, well-sealed semihard shells, and high quality, sweet kernels with high oil and vitamin E content.

3 Drawing Sheets

Latin name of the genus and species of the plant claimed: *Prunus dulcis*.

Variety denomination: 'MAXIMA'.

BACKGROUND OF THE INVENTION

The present invention relates to a new and distinct cultivar of almond varieties, botanically known as *Prunus dulcis*, and hereinafter referred to by the name 'MAXIMA'.

The disclosure provides a new and distinct variety of almond tree, botanically known as *Prunus dulcis*, synonymous with *Prunus amygdalus* Batsch., *Amygdalus communis* L., and *Amygdalus dulcis* Mill., which belongs to the Rosaceae family, and is hereinafter referred to by the variety denomination 'MAXIMA'.

The new *Prunus dulcis* variety is a product of a controlled breeding program conducted by the inventors Michelle Wirthensohn and Andrew Granger in Adelaide, Australia. The objective of the breeding program was to develop new almond varieties with high production, self-fertility and good kernel characteristics.

The new *Prunus dulcis* 'MAXIMA' originated from a cross in 1997 in Adelaide, Australia. The female or seed parent is *Prunus dulcis* variety designated 'Nonpareil' (unpatented) and the male or pollen parent is the French self-fertile *Prunus dulcis* variety designated 'Lauranne' (unpatented). The new *Prunus dulcis* 'MAXIMA' was selected by the inventors from the progeny of the stated cross in field trials in 2009 in Lindsay Point, Australia. First observations occurred in 2001.

Asexual propagation of the new *Prunus dulcis* 'MAXIMA by grafting onto *Prunus persica* (L.) Batsch rootstock designated 'Nemaguard' (unpatented) was first

performed in 2005 in the orchard located in Lindsay Point, Australia. Asexual propagation of the new *Prunus dulcis* 'MAXIMA' has confirmed that the characteristics as herein disclosed for the new variety are stable and retained through successive generations of asexual propagation. The new variety propagates true-to-type.

Asexual reproduction of the new almond tree has shown that the unique features of this new almond tree are stable and reproduced true to type in successive generations of asexual reproduction.

SUMMARY OF THE INVENTION

The 'MAXIMA' variety of almond is of medium size, slightly smaller than 'Nonpareil' (unpatented), medium vigor with spreading growth and demonstrates very high and regular production of semi-hard shell nuts with kernels having an excellent flavour similar to 'Nonpareil' (unpatented). The harvest maturity is slightly later than 'Nonpareil' (unpatented) and the nuts release from the hulls readily. Double are not produced under growing conditions in the Riverland area of South Australia. The tree is self-incompatible but cross-compatible with 'Nonpareil' (unpatented) and 'Monterey' (unpatented).

The following traits have been repeatedly observed and are determined to be the unique characteristics which make the new variety 'MAXIMA' clearly distinguishable from its parents and the variety most similar of common knowledge which is 'Steliette' (unpatented):

1. very high productivity;
2. large attractive kernels; and
3. ease of harvest.

The following characteristics listed in Table 1 have been repeatedly observed in combination and distinguish 'MAXIMA' as a new and distinct almond variety:

TABLE 1

Trait	New variety 'MAXIMA'	Female parent 'Nonpareil' (unpatented)	Male parent 'Lauranne' (unpatented)	Most similar variety of common knowledge 'Steliette' (unpatented)
Shell type	Semihard	Paper	Hard	Semihard
Tree habit	Spreading	Slightly open	Spreading-drooping	Semi-erect
Self-fertility	Absent	Absent	Present	Present
Flowering time	Medium-medium	Early-medium	Late-very late	Medium
Kernel size	Large	Medium	Small	Large
Time of maturity	Early-medium	Early	Early-medium	Early

Distinguishing characteristics of 'MAXIMA' are set out in Table 1. Plants of the new 'MAXIMA' almond tree have not been observed under all possible environmental conditions and cultural practices. The phenotype may vary somewhat with variations in environment, such as temperature, day length and light intensity, without, however, any variance in genotype.

The primary difference between the new variety and the female parent 'Nonpareil' (unpatented) is the new variety has a semihard shell and large kernel, whereas 'Nonpareil' (unpatented) is papershell with medium size kernel. In comparison to its male parent 'Lauranne' (unpatented), the new variety blooms earlier by about 5-7 days, has larger fruit, and is self-sterile.

The primary difference between the new variety and the most similar variety of common knowledge 'Steliette' (unpatented) is the new variety is self-sterile, whereas 'Steliette' (unpatented) is self-fertile and does not require a pollinator tree planted near to fertilize the flowers and, thus, produce almonds.

BRIEF DESCRIPTION OF THE DRAWING

The accompanying photographs (drawings) illustrate the overall appearance of the new *Prunus dulcis* 'MAXIMA' showing the colors, as true as is reasonably possible with digital reproduction. Colors in the photographs may differ slightly from the color values cited in the detailed botanical description, which accurately describe the color of 'MAXIMA'. The trees were grown on Nemaguard rootstock.

FIG. **1** shows typical flowers of 'MAXIMA', dissected (FIG. **1**A) and in situ (FIG. **1**B).

FIG. **2** shows various images of fruit of 'MAXIMA', including a one year-old shoot, showing green immature fruit (FIG. **2**A), mature fruit in situ (FIG. **2**B), and kernel and dry fruit shape (FIG. **2**C).

FIG. **3** shows a typical four year-old tree of 'MAXIMA' on 15 Sep. 2010.

DETAILED BOTANICAL DESCRIPTION

Plants used in the aforementioned photographs and in the following description were grown outside under natural season conditions and cultural practices which approximate those generally used in commercial almond production. During the production of the plants, day temperatures ranged from about 14.5° C. to 48.2° C., night ranged from about −5.7° C. to 14° C. and light levels ranged from about 126,905 to 564,729 foot-candles. Measurements and numerical values represent averages for typical flowering plants.

The following is a detailed description of the new 'MAXIMA' variety when observed during the growing seasons from 2010 to 2015 at Lindsay Point, Victoria, Australia. During 2015, the 'MAXIMA' trees were nine years of age. Quantified measurements are expressed as an average of measurements taken from a number of trees of 'MAXIMA'. The measurements of any individual tree (or any group of trees) of 'MAXIMA' may vary from the stated average.

Color references are made to The Royal Horticultural Society Colour Chart (R.H.S.)., sixth edition, (2015). Color values were taken under conditions of natural light.

All of the trees of 'MAXIMA', insofar as they have been observed, have been consistent in the characteristics described below.

Classification:

Botanical.—*Prunus dulcis.*

Parentage:

Female, or seed parent.—*Prunus dulcis* variety designated 'Nonpareil', unpatented.

Male, or pollen parent.—French self-fertile *Prunus dulcis* variety designated 'Lauranne', unpatented.

Propagation:

Type.—Budding onto rootstock.

Time to initiate roots.—NA.

Time to produce young plant.—Eight months.

Root description.—'Nemaguard' (unpatented) rootstock.

Plant description:

Tree:

Size.—Slightly smaller than Nonpareil. Mature tree height is approximately 3.8 meters with a spread of approximately 4 meters at about 11 years of age.

Vigor.—Medium.

Density.—High.

Habit.—Spreading.

Trunk:

Diameter.—About 15 cm wide and about 51.2 cm high at about 4 years of age.

Texture.—Slightly rough.

Color of bark.—RHS 177B, light reddish brown.

Lenticels length.—About 2.3 mm.

Lenticels width.—About 1.1 mm.

Lenticels density.—About 13 per cm^2 on nine year-old wood.

Lenticels shape.—Narrow elliptic.

Lenticels color.—RHS 164B, moderate orange yellow.

Current season shoot:

Shape in cross section.—Round.

Color.—RHS 143B, strong yellow green.

Texture.—Smooth.

One year-old shoot:

Length.—Up to about 1.5 m.

Texture.—Rough.

Internode length.—About 14-19 mm.

Thickness.—Thin, about 2.5-3.5 mm.

Shape in cross section.—Round.

Color.—RHS N199C, moderate yellowish brown.

Anthocyanin coloration.—Strong coloration on sunny side; Upper surface: RHS 183A; Lower surface: RHS 144A.
Intensity of anthocyanin coloration.—Strong.
Feathering.—Absent or very slight.
Lenticels.—Present.
Lenticels density.—About 30-33 per cm^2.
Lenticels shape.—Round to elliptic.
Lenticels length.—About 0.9-1.3 mm.
Lenticels width.—About 0.5 mm.

Buds:
Shape.—Lateral: acute; Terminal: acute.
Length.—Lateral: 6.7-7.1 mm; Terminal: 6-9.4 mm.
Diameter.—Lateral: 3.3-3.8 mm; Terminal: 3.3-3.7 mm.
Color.—Lateral: 200B, pubescent; Terminal: 200A, pubescent.

Spurs:
Shape.—Cylindrical.
Length.—About 17.4-45.6 mm.
Diameter.—About 3.4-4 mm.
Color.—RHS 165A.
Leaves per spur.—About 8.73.

Mature wood:
Color.—RHS 165A.

Foliage:
Density.—Dense.

Leaf blade:
Length.—About 55-70 mm, average 61 mm.
Width.—About 19-25 mm, average 21 mm.
Length/width ratio.—Low to medium.
Shape.—Elliptic.
Shape of base.—Obtuse.
Shape of apex.—Acute.
Color.—Upper surface: RHS NN137B, greyish olive green.
Incisions of margin.—Crenate.
Venation type.—Arcuate to pinnate.

Petiole:
Length.—About 20-27 mm, average 24 mm.
Color.—RHS 143A, strong yellow green.
Shape in cross section.—Concave.

Flower buds:
Distribution.—Intermediate.
Shape.—Conical.
Color of tip of petals.—RHS 62D, pale purplish pink.
Color of sepals.—RHS 183B, dark red.
Hairiness of sepals.—Very weak to weak.

Flower:
Diameter of flower.—About 41-52 mm, average about 47 mm, large.
Depth of flower.—About 19.2 mm (average).
Number of flowers.—Single or clusters.
Texture of flowers.—Smooth.
Scent of flowers.—Fragrant.
Length of petals.—About 22.2 (average).
Width of petals.—About 17.34 mm (average).
Texture of petals.—Upper surface: smooth; Lower surface: smooth.
Margin.—Indented, deeply lobed.
Shape of petals.—Elliptic to broad elliptic.
Shape of apex.—Retuse, indented.
Shape of base.—Acute.
Number of petals.—Five or six.
Color of petals.—Upper surface: RHS NN155D with RHS 69D blush, yellowish white; Lower surface: RHS NN155D with RHS 69D blush.
Number of stamens.—About 32.9 (average).
Color of stamens.—White.
Number of pistils.—Always one.
Length of pistils.—About 14.11 mm.
Color of pistils.—RHS 145C.
Position of stigma as compared with anthers.—Below.

Sepals:
Number.—About 5 or 6.
Shape.—Broad elliptic.
Length.—About 7.13 mm (average).
Width.—About 4.77 mm (average).
Apex.—Rounded.
Margin.—Very hairy.
Color.—Outer surface: RHS 144B with pale sections. Inner surface: RHS 144B with nectary RHS 25B becoming paler; nectary is moist.

Pedicels:
Length.—About 2.15 mm (average).
Color.—RHS 144A.

Stamen:
Anthocyanin coloration of filament.—White.
Length of filament.—About 7.69 mm (average).

Stigma:
Size.—Medium.

Pollen:
Amount.—Moderate.
Color.—RHS 153D.

Green fruit:
Shape.—Pointed.
Average length.—About 42.76 mm.
Average width.—About 31.42 mm.
Average thickness.—About 23.49 mm.
Color.—RHS N148A, moderate yellow green.
Pubescence.—Much.

Dry fruit:
Shape.—Ovate.
Shape of apex.—Pointed.
Length.—About 33-39 mm.
Width.—About 23-27 mm.
Thickness.—About 14-17 mm.
Average weight.—About 3.98 g.
Color.—RHS 164B, moderate orange yellow.
Surface.—Smooth with moderate pitting.
Thickness of endocarp.—About 1-3 mm.
Resistance to cracking.—Semihard.
Percentage of kernel to dry fruit.—Approximately 38%.
Keel development.—Medium to strong.
Distribution on tree.—On spurs and one year-old shoots.
Base.—Flat to weakly cordate.
Color.—Inner surface: RHS 164B.

Fruit:
Percentage of double kernels.—None.
Eating quality.—Excellent. Oil content average is about 62.4%; Oleic acid is about 59.9%, Vitamin E is about 51.7 mg/100 g oil.
Production.—Regular fruit bearer.

Kernel:
Shape.—Broad elliptic.
Size.—Large.
Average weight.—About 1.51 g.

Length.—About 22-29 mm.
Width.—About 13-16 mm.
Thickness.—About 7-9 mm.
Main color.—RHS 164B, moderate orange yellow.
Intensity of color.—Light.
Rugosity.—Weak.
Taste.—Sweet.
Apex.—Acuminate, short tip.
Base.—Rounded.
Yield.—About 5,804 kg/ha at 10 years.

Blooming/flowering timing:

Time of beginning of flowering.—August to September (late winter to early spring — Australia); Full bloom up to about six days after 'Nonpareil'.

Time of leaf budburst in relation to beginning of flowering.—Simultaneous to beginning of blooming to later depending on season.

Flowering period.—Mid-August to early September (late winter to early spring — Australia); Up to three and one half weeks depending on the weather; Full bloom about mid-August.

Time of maturity.—Approximately 30 weeks from beginning of flowering (about 7 months from August to March — Australia).

Cultural characteristics:

Susceptibility to disease.—Very good tolerance to bacterial spot.

Storage/shipping:

Storage.—Good storage ability due to high Vitamin E content (about 52 mg/100 mL oil).

Shipping ability.—Good.

Harvest:

Peak.—February (late summer — Australia); Approximately 12 days after Nonpareil.

Pest resistance/susceptibility:

Resistance.—Semi-hard shell is resistant to insect attacks; Very good resistance to bacterial spot and hull rot.

We claim:

1. A new and distinct variety of almond tree (*Prunus dulcis*) named 'MAXIMA', as illustrated and described herein.

* * * * *

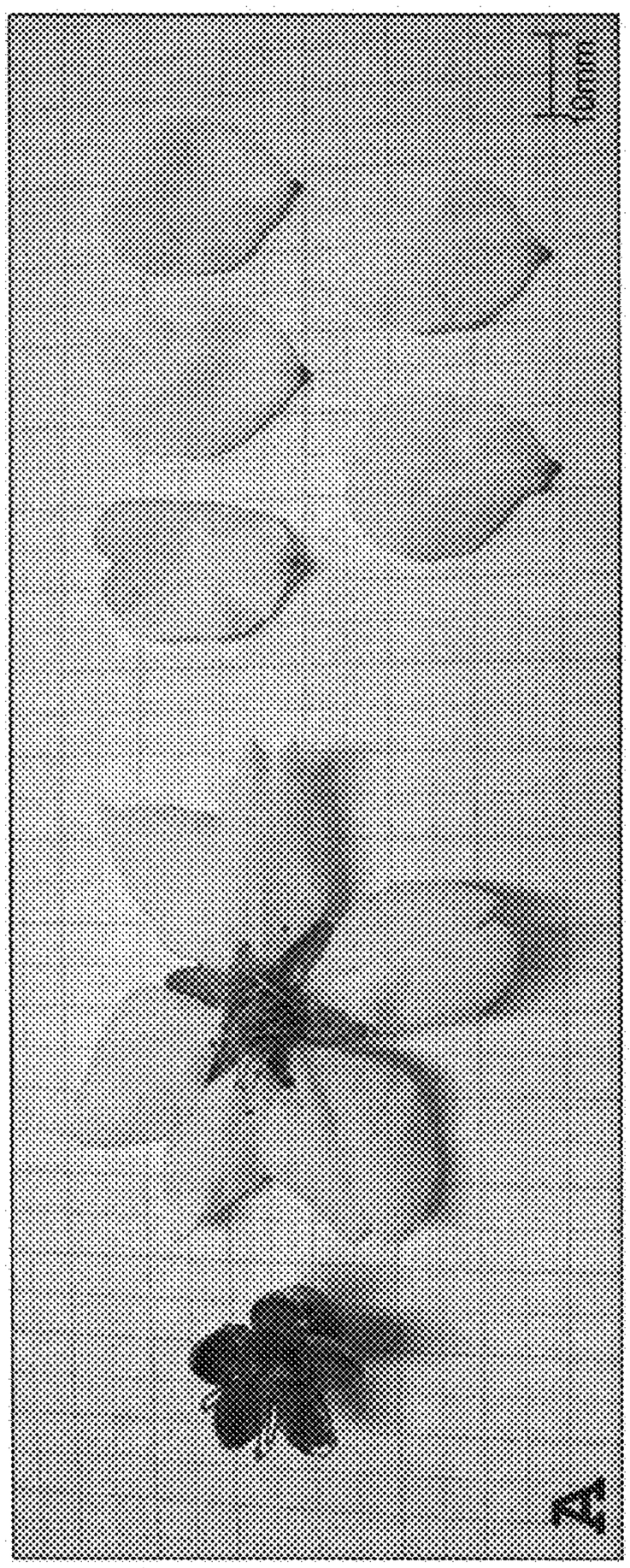

Figure 1

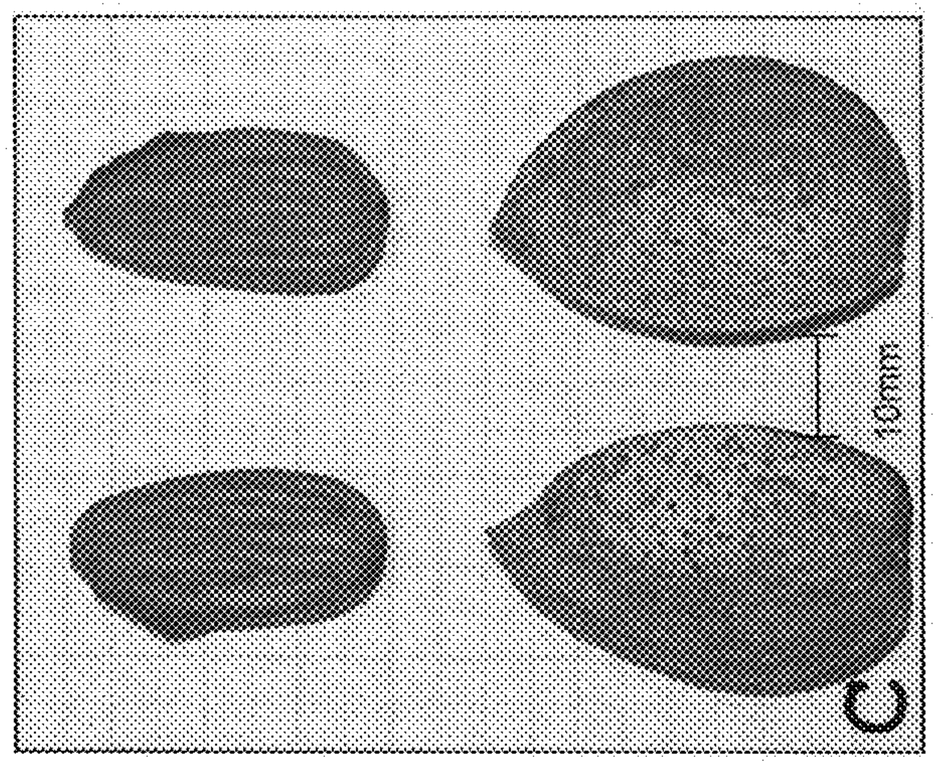

Figure 2

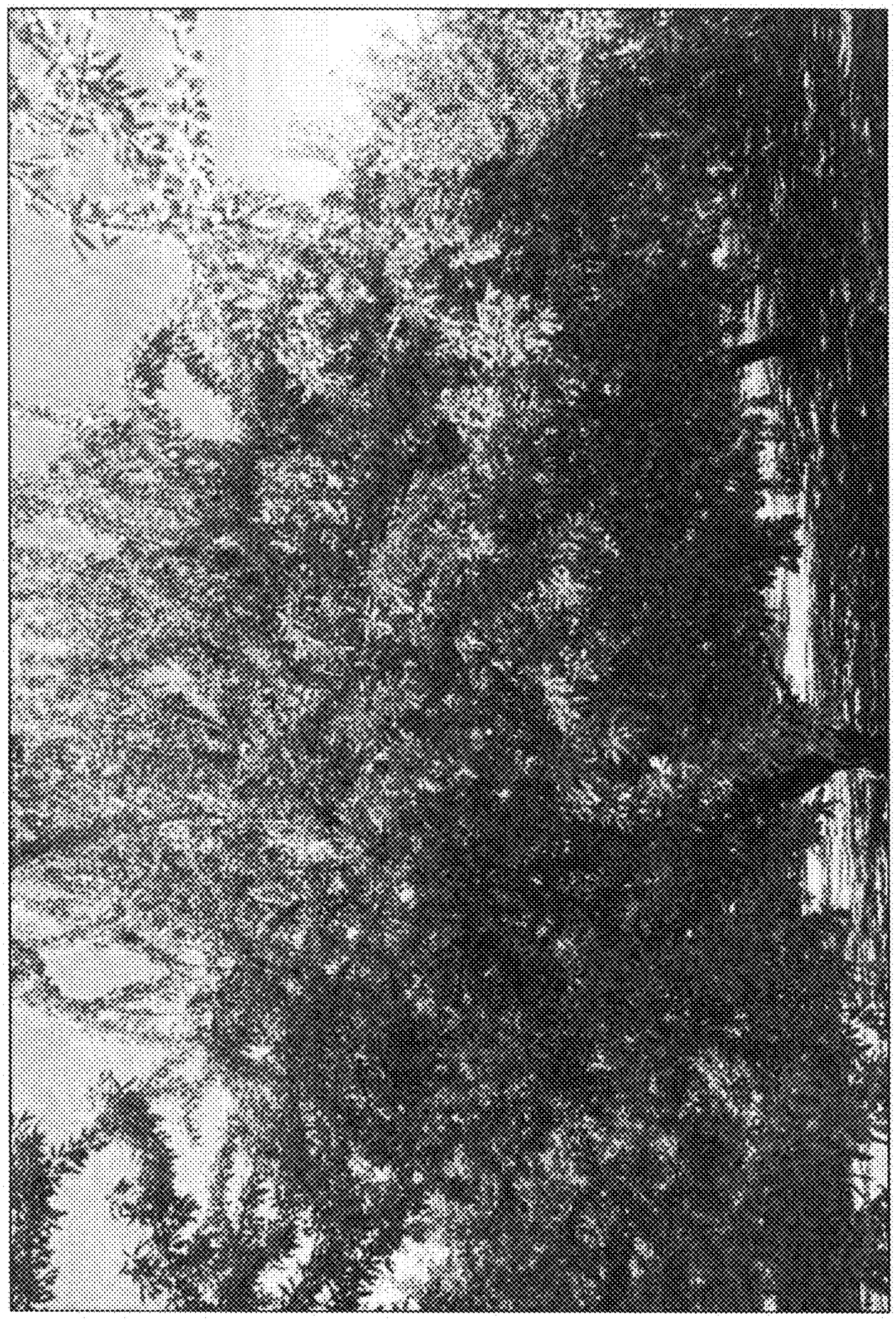

Figure 3