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United States Patent [19]
Cripps

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[45] **Date of Patent:** **Jun. 9, 1992**

[54] **APPLE TREE CRIPPS PINK CULTIVAR**
[75] **Inventor:** **John E. Cripps**, Florent Park,
Australia
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Agriculture, South Perth, Australia
[21] **Appl. No.:** **599,347**
[22] **Filed:** **Oct. 18, 1990**
[51] **Int. Cl.⁵** **A01H 5/00**
[52] **U.S. Cl.** **Plt./34**
[58] **Field of Search** **Plt. 34**

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& Stenzel

[57] **ABSTRACT**

A new variety of apple tree selected from a seedling population of a planned cross, characterized by the taste, flavor and aroma of its high dessert quality sunburn-resistant fruits which have good cold storage and retail shelf life.

5 Drawing Sheets

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BACKGROUND AND SUMMARY OF THE INVENTION

This invention relates to a new and distinct variety of apple tree which was selected from a population of seedlings resulting from a planned cross between the varieties Lady Williams (unpatented chance seedling discovered in Western Australia) and Golden Delicious (unpatented chance seedling discovered in the State of West Virginia). The crosses were made in 1973 by John Cripps, Senior Research Officer, Western Australia Department of Agriculture at the Manjium Horticultural Research Centre in Western Australia.

The new seedling variety first fruited in 1979 and was subsequently selected for propagation and further testing. Second and third generation trees have now borne fruit. It since has been recognized and selected as a new and improved apple variety which is distinctive from its parents as well as from all other apple varieties. The variety produces large asymmetrical, uniquely flavored apples with a partial pink-red blush on a yellow-green background which mature in early May in Western Australia. Its distinctive features include:

1. A strong upright growth form and habit similar to that exhibited by its parent Lady Williams.
2. Low winter chilling requirements.
3. The ability to flower and fruit precociously and set fruit on one-year old upright growth.
4. Fruit having high tolerance to sunburn and a medium to thin skin which doesn't crack.
5. Fruit having a smooth fine flesh texture which resists browning after being cut and exposed to air.
6. Fruit having high soluble sugars.
7. Fruit having an ability to retain long retail shelf life.
8. Fruit having a long cold storage life of up to six months allowing marketing flexibility.

Preliminary cold storage tests on apples harvested from three-year old trees grown at the Manjium Research Centre indicate that this variety does not develop a bitter pit and is highly tolerant to cold storage.

The variety has inherited the sunburn resistance, low chilling requirements and the strong upright growth habit exhibited by one of its parents (Lady Williams) and the excellent fruit quality (high sugar, crisp juicy flesh, thin skin and aromatic flavor) of both of its parent varieties.

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The new seedling variety has been reproduced asexually by budding and grafting. All subsequent asexually produced generations have been true to form in both their growth and fruiting characteristics and show that the foregoing characteristics come true and are established and transmitted through succeeding propagations and generations.

The following Drawings and Detailed Description of the Invention are taken from twenty (20) progeny trees in their third leaf year at the Manjium Horticultural Research Centre during the summer of 1988.

BRIEF DESCRIPTION OF THE DRAWINGS

- FIG. 1 shows the new variety apple tree bearing fruit.
- FIG. 2 is a close-up of one branch of the new variety bearing fruit.
- FIG. 3 shows the foliage of the new variety.
- FIG. 4 shows the flowers of the new variety in bud stage.
- FIG. 5 shows the flowers of the new variety as the buds break.
- FIG. 6 is a close-up of the side of fruit grown on the new variety.
- FIG. 7 is a close-up of the top of fruit shown on the new variety.

The following is a detailed description of the new apple variety with color terminology in accordance with the *Munsell Color Cascade Chart* except where general color terms of ordinary dictionary significance are used.

DETAILED DESCRIPTION OF THE INVENTION

Parentage: A cross of "Golden Delicious" and "Lady Williams" apple varieties.

Locality where grown and observed: Manjium Horticultural Research Centre, Western Australia.

Dates of first and last pickings: About May 1 and May 10, respectively.

Tree: Medium to large with dense foliage. Upright habit, unpruned height to width ratio approximately 1.5 to 1.0 after 3 years.

Vigor.—Very vigorous, young trees average about 1.9 meters of new growth during the growing

season in the nursery row following bud placement.

Trunk.—Medium stocky, smooth.

Branches.—Thick, smooth, upright.

Branching habit.—Much branched with average branching angles (inside measurement) of 45°–50° if allowed to grow naturally.

Pruning and training requirements.—Dependent upon the dwarfing ability of the rootstock used. Adaptable to several styles, but best suited to “central leader” or “slender spindle” type training.

Thinning requirements.—Not subject to the annual bearing habits of some apple cultivars. Use of common chemical thinning methods for non-annual bearing varieties should be employed.

Color.—Green-brown (22-14).

Shape of tipbud.—Rounded.

Lenticels.—Numerous, medium large.

Leaves: Large, wide, long, oval, convex, pointed, medium thick, smooth.

Length.—108 mm (from 4th to 6th fully expanded).

Width.—67 mm (from 4th to 6th fully expanded).

Color.—Green (20-12), medium glossy on upper surface, green (20-10) with weak pubescence on lower surface.

Margin.—Finely serrate, crenate.

Petiole.—Long, medium slender, pubescent. Color — Light green (21-10).

Stipule.—Small.

Central leaf vein.—Color — light green (19-6) with pink tinge toward basal end.

Flowers: Late, large.

Dates of first and full bloom.—About October 10 and November 10, respectively. The subject variety has a prolonged flowering season. Consequently there is no distinct flowering phase which can be classified as early, mid or late. It continues to flower moderately with a progression of flowering buds which open through a four to six week (October/November) flowering season. Since this cultivar has not been grown in the USA, no blooming or harvest dates are available for local conditions.

Size.—Medium to large.

Color.—Red (closed) then pink (open).

Dormant fruit bud shape.—Conical.

Position of margin of petals.—Free to touching.

Fruit:

Maturity when described.—Eating ripe.

Size.—Large, uniform. Length — about 78.3 mm

Breadth — about 82.1 mm Mean fruit weight — about 195 grams.

Production.—Fifth year trees at Manjium Horticultural Centre bore 4 bushels per tree per year with average crop size of 88–100 count.

Coloration.—Fruit has a striking pink blush (absent of striping) covering 30–80% of the apple surface. The pink blush coloration develops gradually in the late season and overlies a yellow-green background. Coloration continues to increase before the harvest season and even as fruits are harvested if the fruits are exposed to sunlight. Coloration is fuller for apples exposed to full sunlight than fruit hanging in shaded areas.

Form.—Asymmetrical, ellipsoid prominent ribbed surface. Medium distal crowns, rounded at base, sides slightly unbroken, unequal.

Axis.—Nonvertical.

Cavity.—Acute, deep, medium width, symmetrical, greenish, with very slight unbroken russet.

Basin.—Medium crown, ribbed, wide, open, medium depth. Markings — None.

Sepals.—Medium, touching.

Stem.—Medium length, medium thickness, not lipped. Length — 20–25 mm. Breadth — 5–6 mm.

Calyx.—Closed, V-shaped, medium width and medium depth. Calyx lobes — Reflexed and divergent. Pubescence — None.

Skin.—Bumpy, greasy. Bloom — absent. Cracking tendency — absent. Thickness — medium. Ground color — yellow-green (23-8). Percentage of red overcolor — 50% to 60%. Overcolor of skin — red (39-12). Russet — none. Lenticels — medium, numerous, roundish.

Flesh.—Juicy, firm. Color — Creme. Texture — Firm. Flavor — Sub acid to sweet. Aroma — Distinct, complex and highly aromatic. Quality — Best.

Core.—Median. Bundle area — Medium small, symmetrical. Halves of area — Equal. Bundles — Inconspicuous. Core lines — Meeting, heart-shaped. Calyx tube — Funnel-form, Pubescence, none. Stem or funnel — Medium long. Depth of tube to shoulder — About 5 mm. Entire depth — About 12 mm. Styles — Some present, united at base. Stamens — Median, in one whorl. Carpels — Closed, axile, symmetrical, smooth, cordate form, emarginate at outer edge near tip. Browning of the flesh (one hour after being cut, with stainless steel knife) — Weak. Firmness of the flesh (measurement with penetrometer) — Firm. Pressure and percent sugar (average of 10 fruit) — Pressure at harvest, 8.1 kg/cm³. % sugar at harvest, 13.6%. Pressure 3-mo cool store, 6.8 kg/cm³. % sugar 3-mo cool store, 13.4%.

Other Characteristics:

Seeds.—One or two per cell, not tufted, acute at point, 8–9 mm long, 5 mm wide, obtuse, dark brown (31-15). Winter chill requirements — Estimated winter chilling requirements are less than 400 hours below 7° C. Potentially adaptable to temperature, mediterranean and partially subtropical climate zones. Soluble sugars mg/g dry wt — 698 (29). Soluble sugars mg/g fresh wt — 111 (7). Soluble solids g/100 ml — 13.9 (0.9). Drymatter % — 15.9 (0.8).

Pollination:

Pollinator	Lady William
% Set	1988 ≈ 55%
	1989 ≈ 0%
	1990 ≈ 50%
Pollinator	Hi Early
% Set	1988 ≈ 70%
	1989 ≈ 50%
	1990 ≈ 55%
Pollinator	Granny Smith
% Set	1988 ≈ 55%
	1989 ≈ 10%
	1990 ≈ N/A
Pollinator	Golden Delicious

-continued

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Pollination:	
% Set	1988 ≈ 50%
	1989 ≈ 0%
	1990 ≈ 30%
Pollinator	Gala
% Set	1988 ≈ 55%
	1989 ≈ 35%
	1990 ≈ 60%
Pollinator	Sundowner
% Set	1988 ≈ 25%
	1989 ≈ 10%

Pollination:	
	1990 ≈ 70%

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Use: Dessert, market.
 Keeping quality: Good (up to six months in coldroom storage and 10-12 months in C.A. storage) Retail shelf life of approximately four weeks at temperatures of 15-18 degrees C.

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What is claimed is:

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1. A new variety of apple tree substantially as herein shown and described characterized by its ability to produce high quality dessert type fruits on spurs growing on upright limbs, firm, juicy, creamy-white flesh and excellent storage characteristics.

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FIG. 1



FIG. 2



FIG. 3

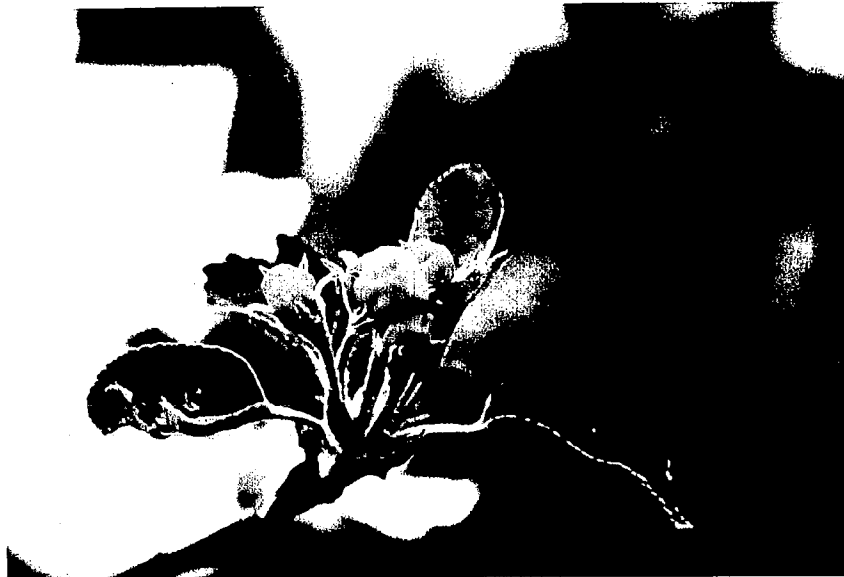


FIG. 4



FIG. 5

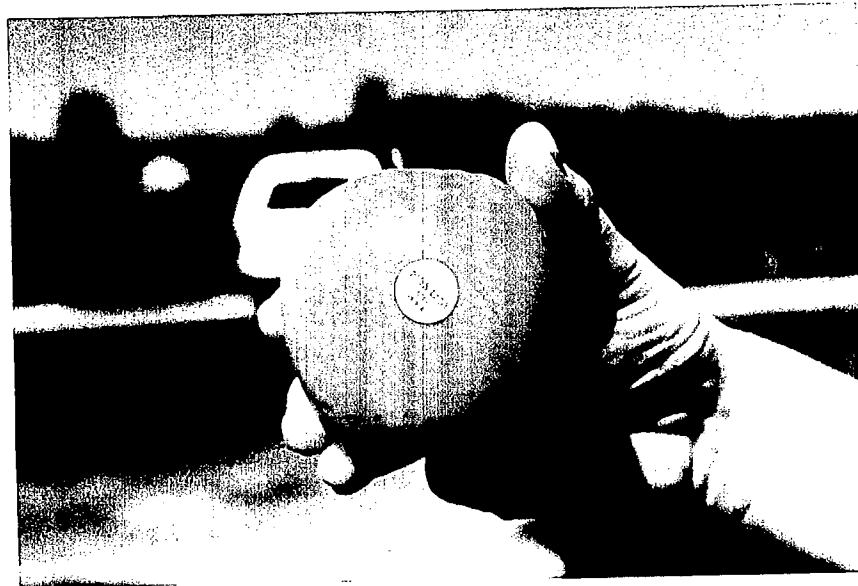


FIG. 6

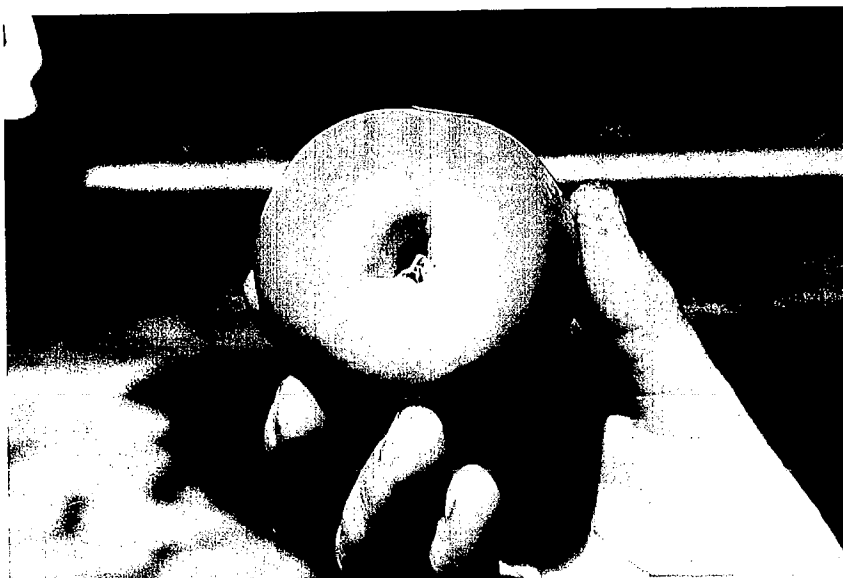


FIG. 7



US00PP18812P3

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

(10) **Patent No.:** **US PP18,812 P3**
(45) **Date of Patent:** **May 13, 2008**

- (54) **APPLE TREE NAMED 'MINNEISKA'**
- (50) Latin Name: *Malus domestica*
Varietal Denomination: **Minneiska**
- (75) Inventors: **David S. Bedford**, New Gemany, MN (US); **James J. Luby**, St. Paul, MN (US)
- (73) Assignee: **Regents of the University of Minnesota**, Minneapolis, MN (US)
- (*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 40 days.

- (52) **U.S. Cl.** Plt./161
- (58) **Field of Classification Search** Plt./161
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

PP2,800 P * 3/1968 Arends Plt./161
 PP7,197 P * 3/1990 Luby et al. Plt./161
 PP11,367 P * 4/2000 Luby et al. Plt./161
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Primary Examiner—Wendy C. Haas

(74) *Attorney, Agent, or Firm*—Penny J. Aguirre

(57) **ABSTRACT**

A new cultivar of apple tree, 'Minneiska' that is characterized by having fruit with an early ripening season, a crisp and juicy texture and slightly tart but well-balanced flavor. The fruit of 'Minneiska' has an unusually long storage life for an early ripening variety and can be stored for 3 to 4 months with little change in texture or flavor.

3 Drawing Sheets

- (21) Appl. No.: **11/580,467**
- (22) Filed: **Oct. 13, 2006**
- (65) **Prior Publication Data**
US 2007/0089206 P1 Apr. 19, 2007

Related U.S. Application Data

- (60) Provisional application No. 60/726,438, filed on Oct. 13, 2005.

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

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Botanical classification: *Malus domestica*.
Varietal denomination: 'Minneiska'.

BACKGROUND OF THE INVENTION

The present invention relates to a new and distinct cultivar of apple tree, botanically known as *Malus domestica* 'Minneiska', referred to hereafter by its cultivar name, 'Minneiska'.

'Minneiska' was selected for its unique a combination of fruit traits. Of particular importance is its early ripening season, its very crisp and juicy texture, and its unusually long storage life for an early ripening variety. The crisp and juicy texture is maintained during storage.

'Minneiska' was discovered in 1999 as a seedling tree by the inventors as Tree 46 in Row 23 of Block 86 at Excelsior, Minn. The new apple tree arose from a cross designated AE 8808 made in 1988 between female parent 'Honeycrisp' (U.S. Plant Pat. No. 7,197) and male parent 'Minnewashta' (U.S. Plant Pat. No. 11,367).

Asexual reproduction of the new cultivar was first accomplished by means of budding and grafting by the inventors in Excelsior, Minn. The asexually propagated trees of 'Minneiska' have been determined to be stable and are reproduced true to type in successive generations.

SUMMARY OF THE INVENTION

The following traits have been repeatedly observed and represent the characteristics of the new cultivar. 'Minneiska' has not been observed under all possible environmental conditions. The phenotype may vary somewhat with varia-

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tions in temperature, day length, light intensity, soil types and water and fertility levels, without, however, any variance in the genotype. The measurements, observations and descriptions that follow describe plants grown outdoors and observed for six years in Excelsior, Minn.

1. 'Minneiska' has an early ripening season with fruit ripening occurring approximately the first week of September in Excelsior, Minn. Ripening time is slightly after 'Minnewashta', and approximately two to three weeks before 'Honeycrisp'.
2. The fruit of 'Minneiska' is about 7.1 to 7.9 cm (2.8 to 3.1 inches) in diameter and conical in shape.
3. The skin fruit color of 'Minneiska' is 70 to 95% red over a yellow-green background.
4. The fruit texture of 'Minneiska' is very crisp, especially for its season of maturity; usually 14 to 19 lbs at harvest.
5. The flavor of the fruit of 'Minneiska' is slightly tart to a well-balanced flavor between sweetness and tartness.
6. The flesh of the fruit of 'Minneiska' is creamy white in color and juicy.
7. The storage life of 'Minneiska' fruit is 90 to 120 days, highly unusual for an early ripening variety.
8. The trees of 'Minneiska' are spreading to slightly upright, are vigorous, and have produced annually under the conditions tested.

'Minneiska' is readily distinguished from its parent 'Honeycrisp' in that the fruit of 'Minneiska' ripen approximately two to three weeks earlier. The tree of 'Minneiska' is more vigorous and more susceptible to apple scab. The fruit of

'Minneiska' are more conic, have more prominent lenticels, and are higher in acidity (0.7% titratable acidity) than fruit of 'Honeycrisp' (0.5% titratable acidity). The fruit of 'Minneiska' have a storage life of 3 to 4 months whereas the fruit of 'Honeycrisp' have a storage life of 7 months. 'Minneiska' is readily distinguished from its parent, 'Minnewashta', in that the flowering time of 'Minneiska' is later (3 to 5 days later at Excelsior, Minn.). The fruit of 'Minneiska' have a storage life of 3 to 4 months whereas the fruit of 'Minnewashta' have a storage life of two months. The fruit of 'Minneiska' are more conic in shape and have greater coverage of red coloration. Fruit of 'Minneiska' seldom drop from the tree prior to harvest whereas 'Minnewashta' trees may show some amount of fruit drop prior to harvest.

The main feature distinguishing 'Minneiska' from other early ripening varieties known to the inventor is the longer time that its fruit can be stored with little change in texture or flavor. 'Minneiska' fruit have a storage life of 3 to 4 months in refrigeration compared to one or two months for other common commercial early season varieties we have observed including 'State Fair' (not patented), 'Arends' (U.S. Plant Pat. No. 2,800), and 'Minnewashta'.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying color photographs were taken in Excelsior, Minn. or at an orchard near Lake City, Minn. and illustrate the distinguishing characteristics of the new cultivar 'Minneiska'. The colors in the photographs are as close as possible with the photographic and printing technology utilized. The color values cited in the detailed botanical description accurately describe the colors of the new apple tree.

FIG. 1 shows a tree of 'Minneiska' budded onto 'Budagovsky 9' (unpatented) rootstock in its second year in the orchard near Lake City, Minn.

FIG. 2 shows a branch of 'Minneiska' with mature fruit.

FIG. 3 provides a close-up view of a mature fruit of 'Minneiska'.

FIG. 4 provides a close-up view of the flesh of a mature fruit of 'Minneiska'.

DETAILED BOTANICAL DESCRIPTION

The following is a detailed description of the new apple variety as observed growing in five field settings for six years in Excelsior, Minn. including the original seedling tree and trees produced by budding or grafting from the original tree. The color names and numbers refer to The 1995 Royal Horticultural Society's Colour Chart, London, England; except for general color terms of ordinary dictionary significance are used.

Botanical classification: Cultivar of *Malus domestica*.
Parentage: 'Honeycrisp' (female), 'Minnewashta' (male).
Tree description:

- Tree habit*.—Spreading to slightly upright.
- Vigor*.—Medium high.
- Diseases resistance*.—Appears to have average susceptibility to apple scab and fire blight.
- Hardiness*.—U.S.D.A. Zone 4.
- Branching habit*.—Spreading to slightly upright.
- Branch frequency*.—Medium.
- Branch strength*.—Intermediate.
- Angle of bearing branches*.—Approximately 90°.
- Predominance of bearing*.—Both spurs and shoots (including tips of shoots).

Description of dormant shoots:

- Pubescence on upper one year-old shoot*.—Medium.
- Shine of bark*.—Weak.
- Thickness of shoot at center of middle internode*.—Means 5.2 mm (range 4.0 to 7.0 mm).
- Bark color (using bark on 1 year old shoots exposed to sun)*.—Reddish brown 183B.
- Shoot angle*.—Approximately 90°.
- Lenticel*.—Medium in size and number, color 159C.

Description of growing shoots.

- Color of growing tip of shoot*.—193A.
- Shape of shoot tip leaves in cross section*.—Concave.
- Pubescence*.—Weak to medium on upper side of leaf and dense on lower side.
- Color of lower side of shoot tip leaves*.—194B on lower side and 146C to 146B on upper side.
- Distribution of color other than green on shoot tips leaves*.—None.

Leaf description:

- Leaf orientation*.—Outward.
- Leaf division*.—Simple.
- Leaf shape*.—Ovate or oval.
- Leaf blade size*.—Average of 10.2 cm in length and 5.6 cm in width (4th to 6th leaf).
- Leaf apex*.—Mostly cuspidate.
- Leaf base*.—Oblique or cuneate.
- Leaf surface*.—Medium glossiness on upper surface, pubescent on lower surface.
- Leaf margin*.—Mostly crenate to slightly serrate.
- Leaf color*.—Upper surface 147A, lower surface 147C.
- Leaf anthocyanin on lower surface*.—Only at base of petiole 187D.
- Leaf venation*.—Pinnate main veins with netted minor veins.
- Petiole size*.—Average of 3.25 cm in length, 1.9 in diameter.
- Petiole color*.—Green (145B). May have tinge of anthocyanin in the basal 5 mm.
- Stipules*.—Small to medium in size (mean 11 mm, range 9 to 13 mm), only found on actively growing shoots where they are present on newly developed leaves but abscise on older leaves.

Flower description:

- Flowering period*.—Mid to late season.
- Beginning flowering date*.—Typically about May 8th, after 'Minnewashta' and similar to 'Honeycrisp'.
- Number of flowers*.—Average of 6 per cluster.
- Inflorescence type*.—Corymb of rotate flowers.
- Flower buds*.—68A in color at pink tip stage, round to conical in shape, average of 1 cm in length and 5 cm in diameter.
- Flower size*.—Average of 5.4 mm in diameter, 1.5 cm in depth.
- Flower fragrance*.—Mild.
- Flower aspect*.—Upright.
- Petals*.—5 per flower, un-fused, mostly overlapping, ovate in shape, obtuse apex, round base, entire margin, about 2.1 cm in length and 1.3 cm in width, color of upper surface is whiter than 155D, color of lower surface is 155D tinged with purple 84B.
- Sepals*.—5 per flower, 141D in color with tips 78B (upper and lower surface), slight to moderate pubescence, triangular in shape, entire margin, acute apex, fused base, average of 1 cm in length and 3.6 mm in width.

Pedicel.—144A in color, average of 1.9 cm in length and 2 mm in width.

Pistil.—Compound carpel with 5 stigmas fused at base, 1 cm in length, style is 150B in color and 8 mm in length, stigma is 150B in color, ovary is pubescent and 139D in color.

Stamens.—About 19 per flower, anther is oblong in shape, 10A in color and 2 mm in length, pollen is 1C in color and moderate in abundance.

Fruit description:

Fruit size.—Medium to large, 7.1 to 7.9 cm in diameter, 6.0 to 7.0 cm in height.

Position of maximum diameter.—Midway between proximal and distal ends.

Fruit shape.—Globose conical.

Fruit symmetry.—Mostly asymmetric due to variation at the distal end.

Fruit prominence of ribbing.—Weak.

Fruit aperture of eye.—Usually closed.

Size of eye.—Medium (mean 9.5 mm, range 6 to 13 mm).

Persistence of calyx.—Persistent at harvest.

Length of sepal.—Medium (mean 6.3 mm, range 4 to 9 mm).

Spacing of sepals at base.—Mostly overlapping.

Depth of eye basin.—Medium (mean 5.6 mm, range 4 to 8 mm).

Width of eye basin.—Medium (mean 28.4 mm, range 23 to 30 mm).

Thickness of stalk.—Medium (mean 2.5 mm, range 2 to 4 mm).

Length of stalk.—Short to medium (mean 17.9 mm, range 12 to 25 mm).

Depth of stalk cavity.—Medium (mean 14.1 mm, range 12 to 16 mm).

Width of stalk cavity.—Medium (mean 33.2 mm, range 28 to 36 mm).

Relief of surface.—Smooth except for lightly protruding lenticels or russet areas.

Bloom of skin.—Light or medium.

Waxiness of skin.—Weak.

Thickness of skin.—Medium.

Skin color.—Pale yellow (12D) to yellow-green (150B) with red overcolor ranging from 46D in light areas to 46A in dark areas, overcolor amount is 70 to 95% of surface, overcolor type is blushed with faint striping.

Presence of russet.—Variable. Always present around stalk cavity. On some fruit it may be more extensive spreading from the stalk cavity through the equatorial region to the eye basin, ranging from small streaks to an extensive netted pattern.

Lenticels.—Medium to large (mean 1.1 mm, range 0.7 to 1.7 mm), intermediate to high prominence.

Color of flesh.—Creamy white (158A).

Distinctness of core line.—Very weak.

Aperture of locules.—Closed.

Fruit set.—Intermediate.

Fruit maturity date.—Early, harvest season is approximately the first week of September in east central Minnesota, slightly after 'Minnewashta' and approximately two to three weeks before 'Honeycrisp'.

Seed.—Brown-grey (199B) when dry, ovoid to somewhat deltoid in shape, length 9.5 mm (range 9.0 to 10.0 mm) and maximum diameter 4.7 mm (range 4.0 to 5.2 mm).

Browning of flesh.—Medium.

Firmness (without skin).—Medium to High, 16 to 19 lbs.

Texture of flesh.—Coarse, crisp, and juicy, maintained during storage for 90-120 days.

Cropping frequency.—Annually.

Acidity.—0.7033% titratable acidity (malic acid equivalent) ('Honeycrisp' 0.5042% titratable acidity).

Brix.—14.8° ('Honeycrisp' 14.7°).

Storage life.—90 to 120 days in common stage (34 to 37° F.), unusually long storage life for an early ripening variety.

We claim:

1. A new and distinct variety of Apple Tree designated 'Minneiska' as described and illustrated herein.

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FIG. 1