UPOV
International Union for the Protection of New Varieties of Plants

E

Technical Working Party for Fruit Crops

Fifty-Fourth Session
Nîmes, France, July 3 to 7, 2023

TWF/54/8

Original: English
Date: June 13, 2023

VARIETY DESCRIPTION DATABASES

Document prepared by an expert from the International Community of Breeders of Asexually Reproduced Ornamental and Fruit Varieties (CIOPORA)

The annex to this document contains a copy of a presentation “Pomological descriptive databases”, to be made by an expert from the International Community of Breeders of Asexually Reproduced Ornamental and Fruit Varieties (CIOPORA), at the fifty-fourth session of the Technical Working Party for Fruit Crops (TWF).

[Annex follows]

Pomological descriptive databases

UPOV Technical Working Party for Fruit Crops 54 • Nîmes, July 3-7, 2023

David Karp • University of California, Riverside


'Bella Gold' interspecific *Prunus*


'WA 38' apple


'7ELS1' lemon


'IFG Twenty-one' grape


'Robert Livermore' walnut

Register of New Fruit and Nut Cultivars List 51

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Crop listings. Almond, Apple, Apricot, Avocado, Avocado rootstock, Blackberry, Blue Honeysuckle, Blueberry, Cacao, Cherimoya, Cherry–sweet, Cherry–tart, Cherry rootstock, Chestnut, Citrus, Citrus rootstock, Cranberry, Currant, Elderberry, Goji, Grape, Hazelnut, Kiwifruit, Mango, Mulberry, Nectarine, Passion Fruit, Peach, Pear, Pecan, Pineapple, Pistachio, Pistachio rootstock, Plum and interspecific hybrids, Raspberry, Red Bayberry, Strawberry, Sugar Apple, Walnut.

ALMOND

Thomas M. Gradziel, Dept. of Plant Sciences, University of California, Davis, CA

Booth. Self-incompatible, kernel-to-shell ratio 60%. **Origin:** parentage unknown, seedling found in a Nonpareil and No Plus Ultra orchard in Orland, CA, by R.D. Booth and F.R. Booth; USPP 34,044; 3 Mar. 2022. **Nut:** ovate; paper shell; kernel midsize, 1.3 g, slightly wider and darker than Sonora and easily blanched; possible high doubles early in orchard production; shell exhibits slight to prominently cuspidate apex; harvest ~12 d after Nonpareil. **Tree:** growth habit upright to spreading; productive, crops heavily on spurs; blooms with Nonpareil; chill requirement 450 h.

Malako. Self-fertile, S-genotype (*S5S7*), kernel to shell ratio 33%. **Origin:** Centro de Edafología y Biología Aplicada del Segura Consejo Superior de Investigaciones Científicos, Espinardo, Murcia, Spain, by F. Dicenta, F. Cremades, P.J. Martínez-García, P. Martínez-Gómez, E. Ortega, M. Robles, R. Sánchez-Pérez, J. López-Alcolea, and J. Egea. Lauranne × S5133; crossed 1997; selected 2009; introd. 2017. CPVO PBR 60079; 7 Feb. 2022. **Nut:** well-sealed; shells very hard; kernels medium, 1.2 g, with <1% doubles; harvest time similar to Ferragnes. **Tree:** vigorous; upright to slightly spreading; bearing primarily on spurs and brindles; blooms 20 d after Nonpareil.

Matan. Self-fertile, S-genotype (*S5* or *S7* and *Sf*), kernel to shell ratio 47%. **Origin:** Newe Ya'ar Research Center, Israel, by D. Holland, I. Bar-Ya'akov, and K. Hatib. Lauranne × Um ElFahem; crossed 2002; selected 2006; introd. 2012. Israeli PBR 3150; 14 Feb. 2012. USPP 27,858; 17 Jan. 2012. USPVP applied for. **Nut:** large; elongated and ovate; shells well-sealed, semi-hard; kernels large, 1.48 g; <5% doubles; harvest late; 2–3 weeks before Lauranne. **Tree:** vigorous, upright, moderately spreading; blooms 10–14 d before Lauranne; chilling requirement ~100 h.

Penta. See Pentacebas Csic.

Published online 25 August 2022.

Pentacebas Csic (Penta). Self-fertile, S-genotype (*S55f*), kernel-to-shell ratio 35%. **Origin:** Centro de Edafología y Biología Aplicada del Segura–Consejo Superior de Investigaciones Científicas, Espinardo, Murcia, Spain, by F. Dicenta, T. Cremades, P.J. Martínez-García, P. Martínez-Gómez, E. Ortega, M. Robles, R. Sánchez-Pérez, J. López-Alcolea, and J. Egea. S5133 × Lauranne; crossed 1998; selected 2009. CPVO PBR 35206; 6 May 2013. **Nut:** well-sealed, shells very hard; kernels medium, 1.0 g; <1% doubles; harvest time 10 d before Ferragnes. **Tree:** vigorous; growth habit upright, moderately spreading; crops heavily on spurs and shoots; blooms 23 d after Nonpareil.

Vela. Self-fertile, kernel-to-shell ratio 55%. **Origin:** University of Adelaide, Adelaide, South Australia, Australia, by M. Wirthensohn. Chellaston × A97001-1B147 (Nonpareil × Lauranne); crossed 2002, selected 2009; introd. 2018. Australian PBR 6308; 18 Mar. 2020. USPP 30,228; 26 Feb. 2019. **Nut:** medium; weakly cordate; well-sealed hard-paper shells; kernels large, 1.83 g, 57% oil; <1% doubles; harvest time 10 d after Nonpareil. **Tree:** growth habit slightly open; crops heavily on spurs; blooms just before Nonpareil.

Yorizane. Self-fertile, S-genotype (*S5Sf*), kernel-to-shell ratio 67%. **Origin:** USDA-ARS, Parlier, CA, by C. Ledbetter. Tuono × ARS 74-48; crossed 1998; selected 2003; introd. 2021. Not licensed, available to all interested growers and breeders. **Nut:** medium; oblong; well-sealed paper shells; kernels medium, 0.99 g, very few doubles; harvest time with to just after Nonpareil. **Tree:** growth habit upright to spreading; crops heavily on spurs; blooms with to just after Nonpareil.

APPLE

Sarah Kostick, Dept. of Horticultural Science, University of Minnesota, Saint Paul, MN

Kate Evans, Tree Fruit Research and Extension Center, Washington State University, Wenatchee, WA

Babylove. Small, flat, orange-red apple with good eating quality. **Origin:** Agro Selections Fruits, Fline, France, by L. Maillard and A. Maillard. Regalyou O.P. CPVO PBR applied for. USPP 32,964; 13 Apr. 2021. **Fruit:** very small to small; round flat; 95% luminous orange-red to red with yellow-orange ground color; flesh firm, crunchy, melting, juicy; flavor semi-sweet, aromatic; acidity moderate; 12.0–12.8 °Brix; ripens very late, first 2

Register of New Fruit and Nut Cultivars

The Register is not:

- A governmental publication
- An official national list
- An Intl. Cultivar Registration Authority
- Involved in regulating intellectual property

It is:

- A pomological (scientific) publication
- Started in 1944, before UPOV or ICNCP
- Published biennially in HortScience (ASHS)
- Curated by the American Pomological Society and the ASHS
- Content written by 55 pomologists
- Currently edited by D. Karp and K. Gasic

It includes:

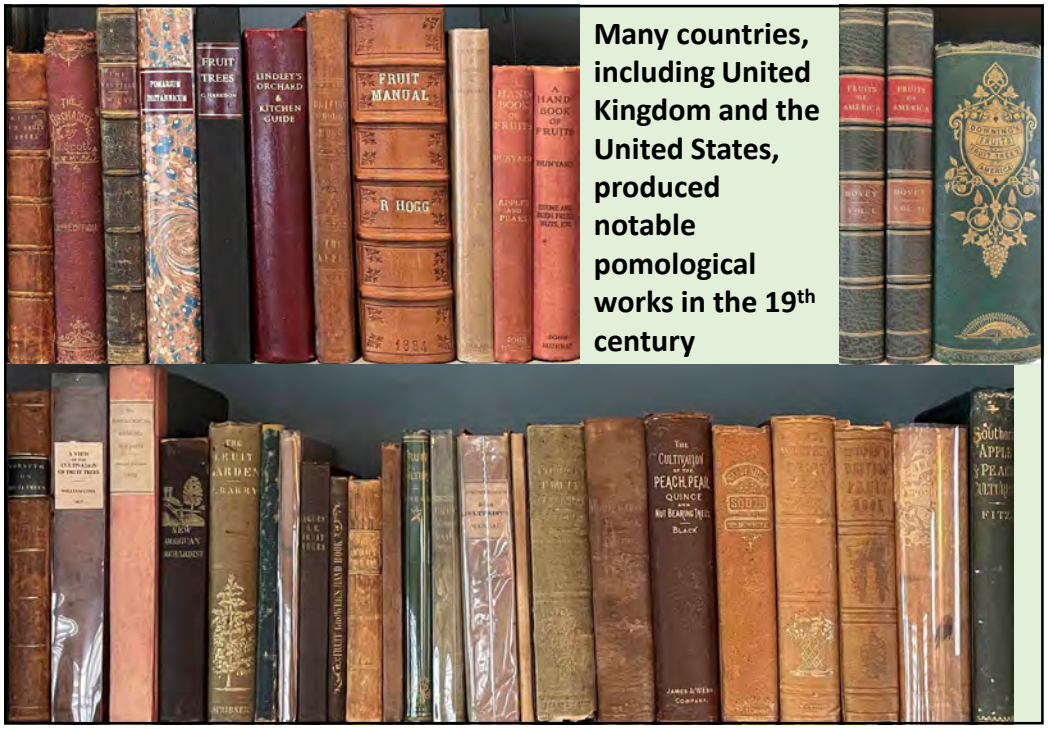
- Fruits and nuts of North American origin, present in NA, and/or important in NA
- Both public and protected cultivars
- Only cultivars introduced in 1920 or later
- Nomenclature, pedigrees, breeders, IP details, descriptions of trees/plants, fruits/nuts

Duhamel Du Monceau
Father of descriptive pomology

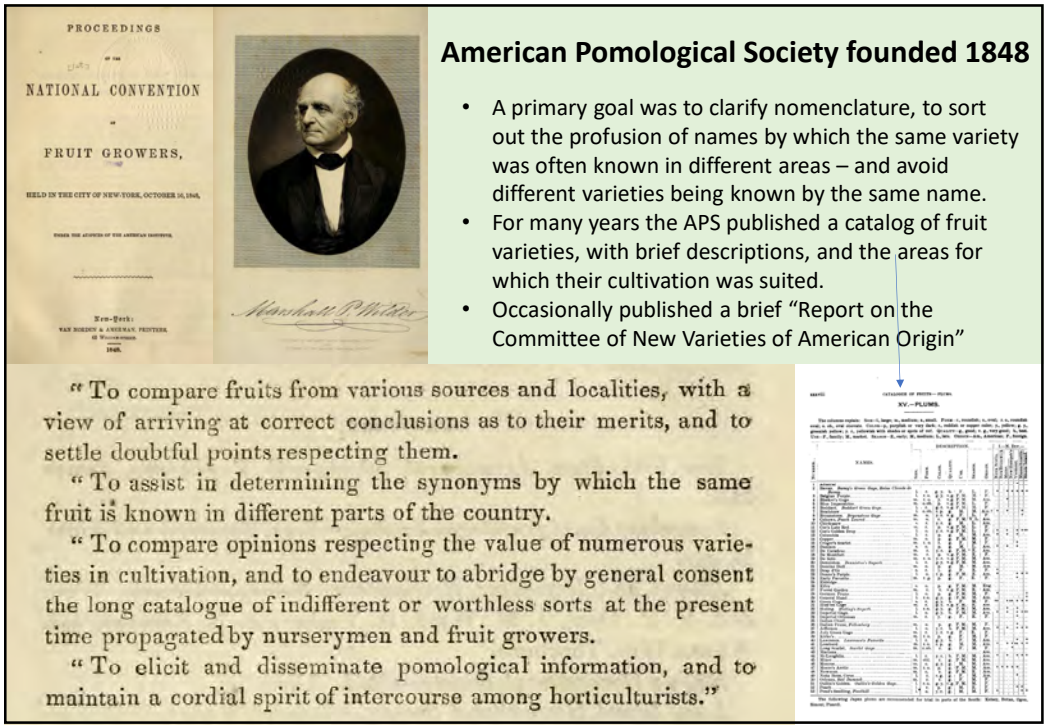
- French botanist, 1700-1782.
- Introduced scientific method in pomological descriptions in his *Traité des Arbres Fruitiers*, 1768.
- Included tree characters.
- Distinguished varieties.
- Many editions through 1846.

Mid-19th century apogee of pomological encyclopedias, in France and Belgium

- Bivort, Alexandre. *Annales de Pomologie Belge et Étrangère* (8 vol., 1853-60).
- Decaisne, Joseph. *Le Jardin Fruitier du Museum* (9 vol., 1858-73).
- Leroy, André. *Dictionnaire de Pomologie* (6 vol., 1867-79).
- Mas, Alphonse. *Pomologie Générale* (12 vol., 1872-84).
- Mas, Alphonse. *Le Verger* (8 vol., 1865-74).
- Poiteau, Antoine. *Pomologie Francaise* (4 vol., 1846).



Many countries, including United Kingdom and the United States, produced notable pomological works in the 19th century



American Pomological Society founded 1848

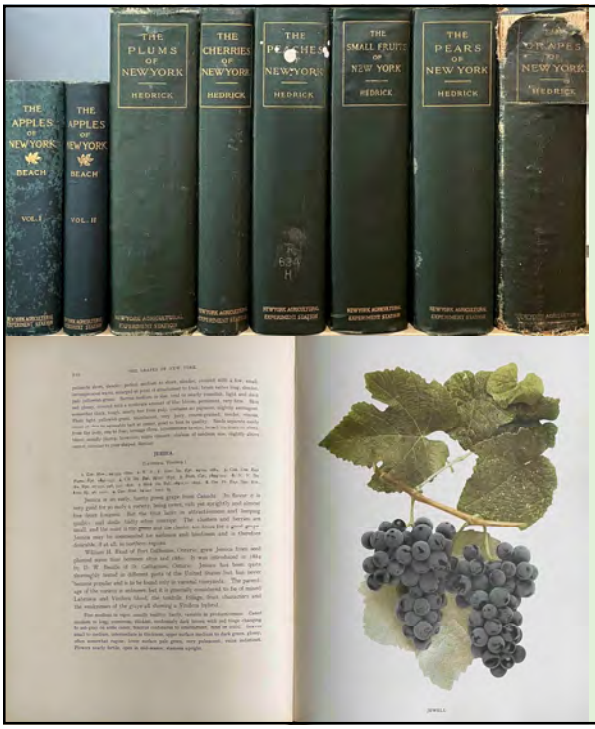
- A primary goal was to clarify nomenclature, to sort out the profusion of names by which the same variety was often known in different areas – and avoid different varieties being known by the same name.
- For many years the APS published a catalog of fruit varieties, with brief descriptions, and the areas for which their cultivation was suited.
- Occasionally published a brief "Report on the Committee of New Varieties of American Origin"

"To compare fruits from various sources and localities, with a view of arriving at correct conclusions as to their merits, and to settle doubtful points respecting them.

"To assist in determining the synonyms by which the same fruit is known in different parts of the country.

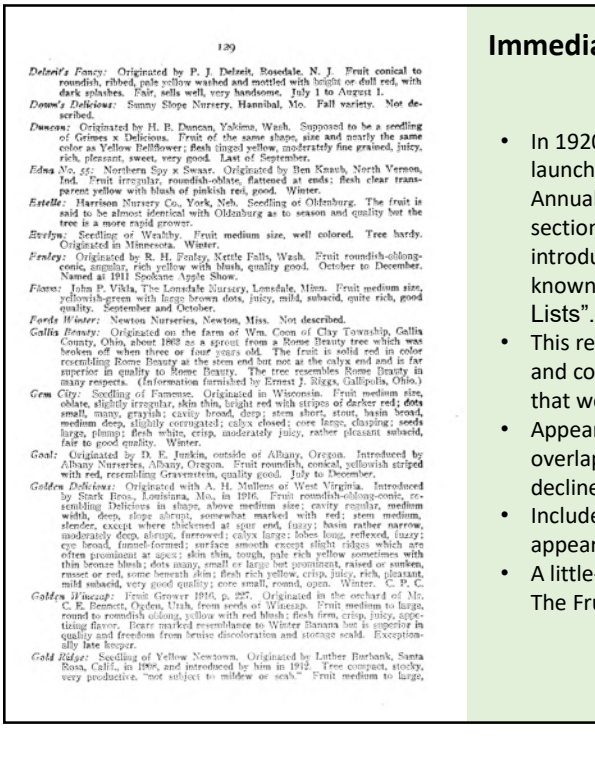
"To compare opinions respecting the value of numerous varieties in cultivation, and to endeavour to abridge by general consent the long catalogue of indifferent or worthless sorts at the present time propagated by nurserymen and fruit growers.

"To elicit and disseminate pomological information, and to maintain a cordial spirit of intercourse among horticulturists."



The Fruits of New York, 1905-25

- Set the standard for pomological descriptive literature
- By S.A. Beach (Apples) and U.P. Hedrick (Plums, Cherries, Peaches, Small Fruits, Pears, and Grapes)
- Published by the New York Agricultural Experiment Station
- Included names, taxonomy, literature citations, history, overview, and descriptions of tree/plant and fruit
- Good but not great illustrations



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Delzeit's Fancy: Originated by P. J. Delzeit, Rosedale, N. J. Fruit conical to roundish, ribbed, pale yellow washed and mottled with bright or dull red, with dark splashes. Flair, sells well, very handsome. July 1 to August 1.

Down's Delicious: Sunny Slope Nurrery, Hannibal, Mo. Fall variety. Not described.

Duncan: Originated by H. B. Duncan, Yakima, Wash. Supposed to be a seedling of Grimes x Delicious. Fruit of the same shape, size and nearly the same color as Yellow Bellflower; flesh tinged yellow, moderately fine grained, juicy, rich, pleasant, sweet, very good. Last of September.

Edwa No. 55: Northern Spy x Swaar. Originated by Ben Knauh, North Vernon, Ind. Fruit irregular, roundish-oblate, flattened at ends; flesh clear transparent yellow with blush of pinkish red, good. Winter.

Estelle: Harrison Nurserry Co., York, Neb. Seedling of Oldenburg. The fruit is said to be almost identical with Oldenburg as to season and quality but the tree is a more rapid grower.

Evelyn: Seedling of Wealthy. Fruit medium size, well colored. Tree hardy. Originated in Minnesota. Winter.

Fenley: Originated by R. H. Fenley, Kettle Falls, Wash. Fruit roundish-oblong-conic, angular, rich yellow with blush, quality good. October to December. Named at 1911 Spokane Apple Show.

Flores: John P. Vikla, The Lonsdale Nurserry, Lonsdale, Minn. Fruit medium size, yellowish-green with large brown dots, juicy, mild, subacid, quite rich, good quality. September and October.

Fords Winter: Newton Nurseries, Newton, Miss. Not described.

Gallia Beauty: Originated on the farm of Wm. Coon of Clay Township, Gallia County, Ohio, about 1868 as a sprout from a Rome Beauty tree which was broken off when three or four years old. The fruit is solid red in color resembling Rome Beauty at the stem end but not at the calyx end and is far superior in quality to Rome Beauty. The tree resembles Rome Beauty in many respects. (Information furnished by Ernest J. Riggs, Gallipolis, Ohio.)

Gem City: Seedling of Famense. Originated in Wisconsin. Fruit medium size, oblate, slightly irregular, skin thin, bright red with stripes of darker red; dots small, many, grayish; cavity broad, deep; stem short, stout, basin beard, medium deep, slightly corrugated; calyx closed; core large, clasping; seeds large, plump; flesh white, crisp, moderately juicy, rather pleasant subacid, fair to good quality. Winter.

Goal: Originated by D. E. Junkin, outside of Albany, Oregon. Introduced by Albany Nurseries, Albany, Oregon. Fruit roundish, conical, yellowish striped with red, resembling Gravenstein, quality good. July to December.

Golden Delicious: Originated with A. H. Mullens of West Virginia. Introduced by Stark Bros, Louisiana, Mo., in 1916. Fruit roundish-oblong-conic, resembling Delicious in shape, above medium size; cavity regular, medium width, deep, slope abrupt, somewhat marked with red; stem medium, slender, except where thickened at apex end, fuzzy; basin rather narrow, moderately deep, abrupt, furrowed; calyx large; lobes long, reflexed, fuzzy; eye broad, funnel-formed; surface smooth except slight ridges which are often prominent at apex; skin thin, tough, pale rich yellow sometimes with thin bronze blush; dots many, small or large but prominent, raised or sunken, russet or red, some beneath skin; flesh rich yellow, crisp, juicy, rich, pleasant, mild subacid, very good quality; core small, round, open. Winter. C. P. C.

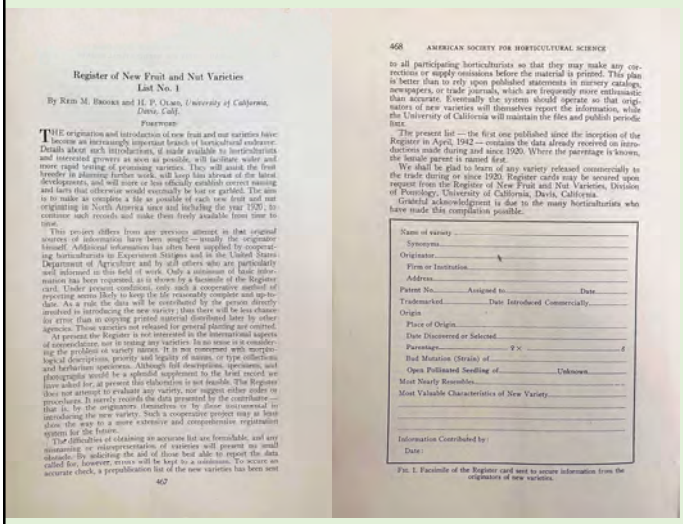
Golden Wincap: Fruit Grower 1916, p. 227. Originated in the orchard of Mr. C. E. Bennett, Ogden, Utah, from seeds of Winesap. Fruit medium to large, round to roundish oblong, yellow with red blush; flesh firm, crisp, juicy, appetizing flavor. Bearr marked resemblance to Winter Banana but is superior in quality and freedom from bruise discoloration and storage scald. Exceptionally late keeper.

Gold Ridge: Seedling of Yellow Newtown. Originated by Luther Burbank, Santa Rosa, Calif., in 1888, and introduced by him in 1912. Tree compact, stocky, very productive, "not subject to mildew or scab." Fruit medium to large,

Immediate predecessor of the Register

- In 1920 the American Pomological Society launched in its Proceedings a new “Pomological Annual”, which included an extensive (52-page) section called “Descriptions of new fruits (new introductions) of the world”. That later became known as the “New Fruit and Nut Variety Lists”.
- This resembled the Register in look and purpose, and consciously aimed to include those varieties that were not in The Fruits of New York books.
- Appeared in the APS Proceedings 1920-1951, overlapping with the Register from 1944; was in decline in its later years.
- Included many important varieties that did not appear in the Register, such as ‘Golden Delicious’.
- A little-known and underexploited link between The Fruits of New York and the Register.

Register of New Fruit and Nut Varieties begins with List 1 in 1944



Register of New Fruit and Nut Varieties
List No. 1

By Reid M. Brooks and H. P. Olmo, *University of California, Davis, Calif.*

FOREWORD

THE origination and introduction of new fruit and nut varieties have become an increasingly important branch of horticultural endeavor. Details about such introductions, if made available to horticulturists and interested growers as soon as possible, will facilitate wider and more rapid testing of promising varieties. They will assist the fruit breeder in planning further work, will keep him abreast of the latest developments, and will more or less officially establish correct naming and facts that otherwise would eventually be lost or garbled. The aim is to make as complete a file as possible of each new fruit and nut originating in North America since and including the year 1920; to continue such records and make them freely available from time to time.

This project differs from any previous attempt in that original sources of information have been sought — usually the originator himself. Additional information has often been supplied by cooperating horticulturists in Experiment Stations and in the United States Department of Agriculture and by still others who are particularly well informed in this field of work. Only a minimum of basic information has been requested, as is shown by a facsimile of the Register card. Under present conditions, only such a cooperative method of reporting seems likely to keep the file reasonably complete and up-to-date. As a rule the data will be contributed by the person directly involved in introducing the new variety; thus there will be less chance for error than in copying printed material distributed later by other agencies. Those varieties not released for general planting are omitted.

At present the Register is not interested in the international aspects of nomenclature, nor in testing any varieties. In no sense is it considering the problem of variety names. It is not concerned with morphological descriptions, priority and legality of names, or type collections and herbarium specimens. Although full descriptions, specimens, and photographs would be a splendid supplement to the brief record we have asked for, at present this elaboration is not feasible. The Register does not attempt to evaluate any variety, nor suggest either orders or procedures. It merely records the data presented by the contributor — that is, by the originators themselves or by those instrumental in introducing the new variety. Such a cooperative project may at least show the way to a more extensive and comprehensive registration system for the future.

The difficulties of obtaining an accurate list are formidable, and any misnaming or misrepresentation of varieties will present no small obstacle. By soliciting the aid of those best able to report the data called for, however, errors will be kept to a minimum. To secure an accurate check, a prepublication list of the new varieties has been sent

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to all participating horticulturists so that they may make any corrections or supply omissions before the material is printed. This plan is better than to rely upon published statements in nursery catalogs, newspapers, or trade journals, which are frequently more enthusiastic than accurate. Eventually the system should operate so that originators of new varieties will themselves report the information, while the University of California will maintain the files and publish periodic lists.

The present list — the first one published since the inception of the Register in April, 1942 — contains the data already received on introductions made during and since 1920. Where the parentage is known, the female parent is named first.

We shall be glad to learn of any variety released commercially to the trade during or since 1920. Register cards may be secured upon request from the Register of New Fruit and Nut Varieties, Division of Pomology, University of California, Davis, California.

Grateful acknowledgment is due to the many horticulturists who have made this compilation possible.

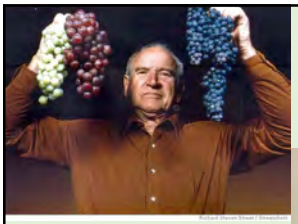
Name of variety .....
Synonyms .....
Originator .....
Firm or Institution .....
Address .....
Patent No. ..... Assigned to ..... Date .....
Trademarked ..... Date Introduced Commercially .....
Origin .....
Place of Origin .....
Date Discovered or Selected .....
Parentage ..... ♀ × ..... ♂
Bud Mutation (Strain) of .....
Open Pollinated Seedling of ..... Unknown.
Most Nearly Resembles .....
Most Valuable Characteristics of New Variety .....

Information Contributed by:
Date:

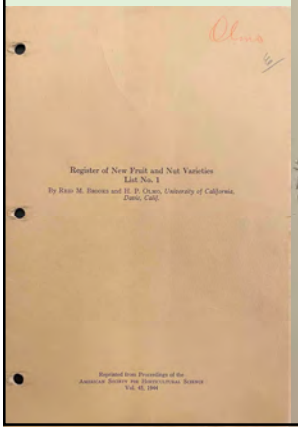
FIG. 1. Facsimile of the Register card sent to secure information from the originators of new varieties.

- Work began April, 1942
- Published in the Proceedings of the ASHS 1944
- By Reid M. Brooks and H.P. Olmo
- Based on original sources, cards filled out by breeders
- "The aim is to make as complete a file as possible of each new fruit and nut originating in North America since and including the year 1920."
- Not interested in nomenclature or detailed descriptions, but hopes the Register "may show the way to a more extensive and comprehensive registration system for the future."

Register of New Fruit and Nut Varieties

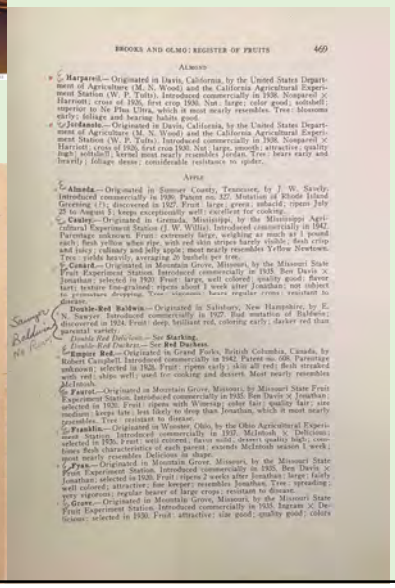


Harold P. Olmo



Register of New Fruit and Nut Varieties
List No. 1

By Reid M. Brooks and H. P. Olmo, *University of California, Davis, Calif.*



BROOKS AND OLMO: REGISTER OF FRUITS 469

ALMOND

Harparell.—Originated in Davis, California, by the United States Department of Agriculture (M. N. Wood) and the California Agricultural Experiment Station (W. P. Tufts). Introduced commercially in 1936. Nonpareil × Harriott; cross of 1926, first crop 1936. Nut: large; color good; softshell; superior to Ne Plus Ultra, which it most nearly resembles. Tree: blossoms early; foliage and bearing habits good.

Jordanolo.—Originated in Davis, California, by the United States Department of Agriculture (M. N. Wood) and the California Agricultural Experiment Station (W. P. Tufts). Introduced commercially in 1936. Nonpareil × Harriott; cross of 1926, first crop 1936. Nut: large, smooth; attractive; quality high; softshell; kernel most nearly resembles Jordan. Tree: bears early and heavily; foliage dense; considerable resistance to spider.

APPLE

Almeda.—Originated in Sumner County, Tennessee, by J. W. Sawtelle. Introduced commercially in 1936. Patent no. 427. Mutation of Rhode Island Greening (?), discovered in 1927. Fruit: large, green; subacid; ripens July 25 to August 5; keeps exceptionally well; excellent for cooking.

Cozier.—Originated in Grenada, Mississippi, by the Mississippi Agricultural Experiment Station (J. W. Wilkie). Introduced commercially in 1947. Parentage unknown. Fruit: extremely large, weighing as much as 2 pounds; early; flesh yellow when ripe, with red skin stripes barely visible; flesh crisp and juicy; culinary and jelly apple; most nearly resembles Yellow Newtown. Tree: yields heavily, averaging 20 bushels per tree.

Conard.—Originated in Mountain Grove, Missouri, by the Missouri State Fruit Experiment Station. Introduced commercially in 1935. Ben Davis × Jonathan; selected in 1920. Fruit: large, well colored; quality good; flavor tart; texture fine-grained; ripens about 1 week after Jonathan; not subject to premature dropping. Tree: vigorous; bears regular crops; resistant to disease.

Double-Red Baldwin.—Originated in Salisbury, New Hampshire, by E. N. Sawyer. Introduced commercially in 1927. Bud mutation of Baldwin; discovered in 1924. Fruit: deep, brilliant red, coloring early; darker red than parental variety.

Double Red Delicious.— See **Starking**.

Double-Red Duchess.— See **Red Duchess**.

Empire Red.—Originated in Grand Forks, British Columbia, Canada, by Robert Campbell. Introduced commercially in 1942. Patent no. 606. Parentage unknown; selected in 1926. Fruit: ripens early; skin all red; flesh streaked with red; ships well; used for cooking and dessert. Most nearly resembles McIntosh.

Fourot.—Originated in Mountain Grove, Missouri, by Missouri State Fruit Experiment Station. Introduced commercially in 1935. Ben Davis × Jonathan; selected in 1920. Fruit: ripens with Winesap; color fair; quality fair; size medium; keeps late; less likely to drop than Jonathan, which it most nearly resembles. Tree: resistant to disease.

Franklin.—Originated in Wooster, Ohio, by the Ohio Agricultural Experiment Station. Introduced commercially in 1932. McIntosh × Delicious; selected in 1926. Fruit: well colored; flavor mild; dessert quality high; combines flesh characteristics of each parent; exceeds McIntosh season 1 week; most nearly resembles Delicious in shape.

Fyas.—Originated in Mountain Grove, Missouri, by the Missouri State Fruit Experiment Station. Introduced commercially in 1935. Ben Davis × Jonathan; selected in 1920. Fruit: ripens 2 weeks after Jonathan; large; fairly well colored; attractive; fine keeper; resembles Jonathan. Tree: spreading; very vigorous; regular bearer of large crops; resistant to disease.

Grave.—Originated in Mountain Grove, Missouri, by the Missouri State Fruit Experiment Station. Introduced commercially in 1935. Ingram × Delicious; selected in 1930. Fruit: attractive; size good; quality good; colors

- Organized by crop, then alphabetically by cultivar
- "Cooperating horticulturists" from each state and province served as contributors
- Half-time secretary handled correspondence and compilation
- Also printed and sold as offprints
- Brooks died in 1966
- Publication shifted to HortScience in 1969
- Olmo continued to direct the Register thru List 34 (1984)

- After a long gap, James Cummins took over as editor and relaunched the Register (1991-1995)
- Contributors organized by crop
- Publication shifted from annual to biennial after 2000
- Subsequent editors:
  —W.R. Okie (1997-2004)
  —John R. Clark and Chad E. Finn (2006-2012)
  —Ksenija Gasic and John E. Preece (2014)
  —Ksenija Gasic, John E. Preece, and David Karp (2016-2020)
  —David Karp and Ksenija Gasic (2022-)

Who is the Register for?

- breeders
- pomologists
- farm advisors
- nurseries
- growers
- IP owners / attorneys /managers / regulators
- anyone interested in fruits and nuts

Kate Evans, Washington State University apple Breeder

What is the Register for?

- consult cultivar descriptions (scions & rootstocks)
- see what's new in fruit and nut breeding
- includes both public and private cultivars over many years
- find IP details
- includes cultivars protected by plant patents, PBR, and utility patents
- find pedigrees
- see if a name has been used
- find trade names corresponding to cultivar names, and vice versa

Not included in the Register

- exclusively ornamental cultivars (must bear fruits or nuts edible by humans or domesticated animals)
- forage plants
- germplasm (wild relatives, species)
- unreleased breeding selections

Potential elements of a Register citrus cultivar description

Cultivar denomination:
Synonym(s):
Trademark(s) that correspond to this denomination:
Fruit type (common name):
Origin firm or institution:
City and state or province of firm or institution:
Origin breeder(s) or discoverer(s):
Female (seed) parent:
Male (pollen) parent:
or O.P. seedling of:
or Mutation parent:
if Mutation, natural or induced:
Place of origin:
Year crossed or discovered:
Year selected:
Name(s) tested as:
Year introduced:

US Plant Patent info (patent number or "applied for"):
Fruit: shape (oblate, spheroid, etc.):
Fruit: size (e.g., large, midsize, small):
Height in mm:
Diameter in mm:
Weight in g:
Skin color:
Skin texture:
Skin thickness (thick, medium, thin):
Skin thickness in mm:
Skin info (other):
Flesh color:
Flesh texture:
Flesh juice content:
Juice °Brix:
Juice TA in %:
TSS/TA ratio:
Flavor:

Aroma:
Seed count:
Season:
Storability or other postharvest info:
Use(s) (if distinctive):
Fruit other info:
Tree ploidy (if other than diploid):
Tree: size:
Vigor:
Growth habit:
Density of foliage:
Thorniness:
Leaves, bark, flowers (if distinctive):
Productivity:
Tendency to alternate bearing:
Susceptibility or resistance to pests, diseases, or other stresses:

Example of a Register cultivar description, for 'JB 06-43-6-22' grape

JB06-43-6-22 (Oh My!®). Seedless, full-sized, edible-skinned muscadine hybrid for fresh use and possibly for juice or wine. **Origin:** P.J. Bloodworth, Hillsborough, NC. JB99-1-4-15 (*Vitis Muscadinia*) × JB03-20-1-21 (hybrid of *V. Muscadinia* [primarily *V. rotundifolia* with admixture of *V. munsoniana*] and *V. Euvitis* [primarily *V. vinifera* with admixture of various other *Euvitis* species]), selected 2008. USPP 31,010; 5 Nov. 2019. **Fruit:** berry midsize, 5.4 g; spherical; skin color ranges from greenish yellow (RHS 153B, 152C) to gray brown (RHS 199A, N199A); skin edible, but not as edible as vinifera, thickness ~1.6 mm; flesh very juicy, yellow-green (RHS 150D), translucent; 16 °Brix; stenospermocarpically seedless; aroma and flavor typical muscadine; harvest mid- to late September. **Cluster:** 56 g, 6-15 berries; globular; density medium. **Vine:** vigorous; phenotype muscadine; growth habit recumbent, climbing; productivity medium-high; no powdery mildew observed, minimal berry rot.

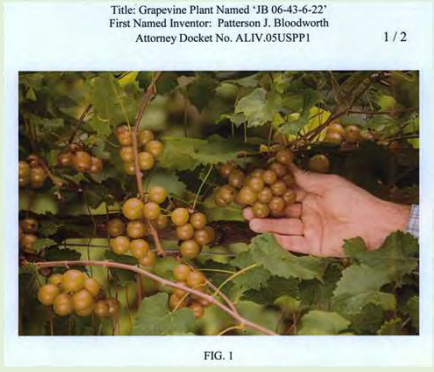
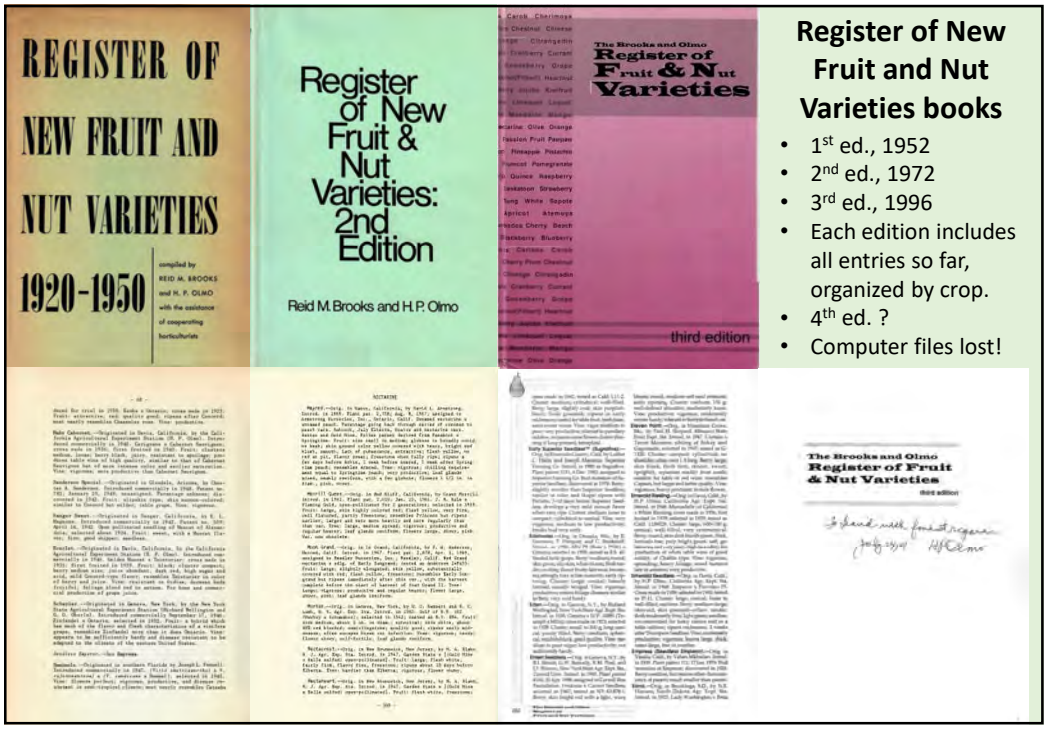


FIG. 1

- Typical length of a cultivar description: 50-175 words
- Register style has never included single quotation marks around cultivar denominations, or SMALL CAPS for trade names
- Brief summary between name(s) and Origin section.
- Attributes are followed by description, in classical pomological style: "flesh very juicy"
- Style follows a detailed "Style Sheet"



Register of New Fruit and Nut Varieties books

- 1st ed., 1952
- 2nd ed., 1972
- 3rd ed., 1996
- Each edition includes all entries so far, organized by crop.
- 4th ed. ?
- Computer files lost!

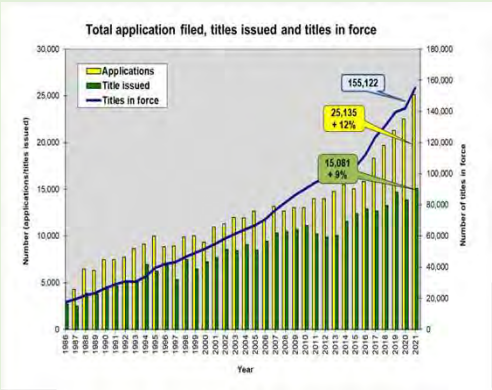
Challenges / Opportunities for the Register

- Profusion of new fruit and nut cultivars
- Globalization of breeding and trade
- Privatization of breeding
- Dual nomenclature: cultivar denominations / trade names
- Multiple IP modes
- New breeding technologies
- Internet
- Shift from observational pomology to genetics / genomics


Preface
Register of New Fruit and Nut Cultivars List 51
David Karp and Kwnlja Gasic, Co-editors

New introduction for List 51

Challenges / Opportunities:
Profusion of new fruit and nut cultivars



Source: UPOV

Challenge

- Great increase in plant patents and PBR for pomological cultivars, and of new cultivars (public + IP-protected) overall
- For some crops Register descriptions are backlogged

Response

- Renewed commitment to making the Register as comprehensive as possible.
- Multiple contributors for backlogged crops
- Maintain comprehensive database of all new IP-protected cultivars, to keep track of which cultivars have been described, and which have not. The sources are many, the best ways to access them change, and it's far easier for one person to compile this information than to expect 50+ contributors to each do this work.

Innovaciones Vegetales 2022

Challenges / Responses:
Globalization of fruit and nut breeding and trade

The Register's original brief was to cover varieties "originating in North America". In practice this was soon modified to include cultivars introduced to NA. "NA" included Canada but not Mexico. Since Nafta (1994), US and Mexican fruit breeding and trade have become so intertwined that to ignore Mexican-bred new cultivars would be to abandon or severely curtail coverage of important crops – not just tropical crops, but especially berries.

- **Challenge**: Mexico (SNICS) does not make PBR technical descriptions publicly available (as far as the presenter has been able to ascertain).
- **Responses**: The Register now includes Mexican cultivars, and recruits Mexican scientists to serve as crop editors. Renewed commitment to covering Canadian cultivars.
- **Challenge**: Many new cultivars are important to North American readers, but it would be impossible for the Register to cover all new fruit and nut cultivars worldwide.
- **Response**: Leave it up to Register contributors to include, as they see fit, a limited number of cultivars not now present in NA, but of scientific and/or economic importance to NA.
- Traditionally the Register listed US plant patent numbers and dates, and only occasionally foreign PBR details. We now try to include: 1) PBR details for country or region of origin, if outside the US; 2) US plant patents, PVP, and utility patents.

Challenges / Responses: Privatization of breeding

- Most new cultivars, whether bred by private companies or public institutions (land-grant universities; USDA, AAFC, INIFAP, etc.), now are protected by plant patents or PBRs. These cultivars often are not available for Register contributors to observe directly; however, protected cultivars must provide descriptions.
- Plant patents typically include a pedigree, narrative of origin, and description of the most important features (the *raison d'être*) of a new cultivar; PBR technical descriptions are more narrowly focused on morphological descriptors that prove distinctness.
- Private breeders sometimes obfuscate pedigrees.
- Private breeders may not be willing to spend time writing cultivar descriptions or providing information to Register crop experts.
- **Response:** Register editors try to schmooze private breeders and emphasize that maintaining the infrastructure of pomological information is in their interest. It helps if these breeders were taught or mentored by public pomologists who can reach out.

Challenges / Responses: Dual nomenclature: cultivar denominations / trade names 1

- Most new cultivars are now assigned code names (e.g., 'SV22-104e-84' grape) instead of traditional "fancy names" (e.g., 'Valley Pearl' grape). This makes approval of the cultivar name simple, and enables rights owners to maintain value after patents or PBRs expire.
- Code names are often paired with registered (®) or common law (™) trademarks that serve as de facto synonyms. For example, 'Plablack 15157' blackberry is marketed as Black Sultana®.
- These correspondences between cultivar names and trade names are crucial information for researchers, but it's not always easy to find out which cultivar names have such synonym-like trade names, and what they are. Moreover, these links can be complex and fluid:
  —A cultivar can be marketed under multiple trade names; e.g. 'Pinova' is marketed as Corail®, Piñata®, and Sonata™.
  —A trade name can be used for more than one cultivar; e.g., multiple apple cultivars are marketed as Pink Lady®. (Some trade name, such as Sunkist® or Cuties® don't qualify as de facto synonyms because they are linked to a wide range of different cultivars or fruit types.)
  —These links often change, and the legal status of trade names (™ or ®) often change.
- UPOV (PLUTO) and CPVO Variety Finder, among others, include columns where trade names are sometimes provided, and for some crops there are online lists; but these are not comprehensive, and there's no authoritative resource known to the Register editors. The Register is the closest thing!

Challenges / Responses:
Dual nomenclature: cultivar denominations / trade names 2

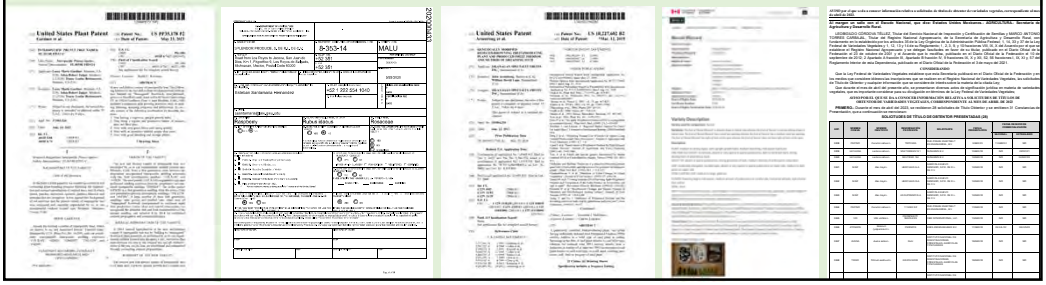
- Whenever the Register editors see a code name, we're aware that there may be a linked trade name. First we (or our contributors) search obvious sources such as breeders' or nurseries' websites; if there is no obvious link, we contact the breeders, their IP managers or licensees directly; finally we check the legal status of trade names on WIPO or USPTO.
- The primary entry in the Register (with the description) is always by cultivar name, because that is fixed, whereas trade names are fluid. (See examples at bottom.)
- Changes are recorded in the "Addenda and Revisions" section at the end of each List.
- In the Register trade names are either ™ or ®, but in reality the situation can be more complex: a registered trademark can be applied for but not yet granted; it could have been registered but may have since been terminated; or it may be registered only in certain countries or regions and not in others (e.g. ® in Europe, but ™ in the United States). It's not always possible to address these complexities within the Register's limited space.
- The contributors and editors do their best to make sure that the Register's information is accurate and current, but ultimately, it's up to the Register's readers to verify the legal status of trade names, as List 51's introduction states.
- Question: Does publishing links in the Register risk genericizing trademarks? SMALL CAPS!

Pink-A-Boo®. See FL 16.78-109.

FL 16.78-109 (Pearl™, Florida Pearl®, Pink-A-Boo®). White-fruited, short-day, partially remontant strawberry adapted to West Central Florida. **Origin:** University of Florida, Wimauma, by V.

Challenges / Responses:
Multiple IP modes and jurisdictions

- In the USA, there are now three ways for breeders to protect new cultivars: plant patents, plant variety protection (since 2020 for asexually propagated crops), and utility patents.
- It's easy to find cultivars protected by PPs and PBRs, but cultivars protected by utility patents are harder to track down systematically.
- IP attorneys sometimes advise clients to "stack" multiple layers of protection.
- **Challenge**: Tracking down and providing links to multiple IP sources is time-consuming.
- Traditionally the Register listed US plant patents, and only occasionally foreign PBR details. We now try to include: 1) PBR details for country or region of origin, if outside the USA; 2) US plant patents, PVP, or utility patents.
- **Opportunity**: Providing a single source for all these strands of information makes Register contributors' tasks easier, and the Register more valuable to readers.

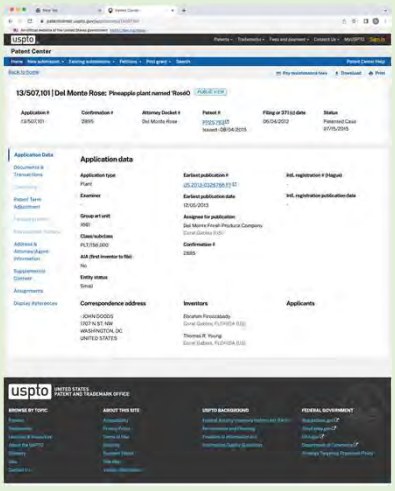


'Rose' pineapple
plant patent photo

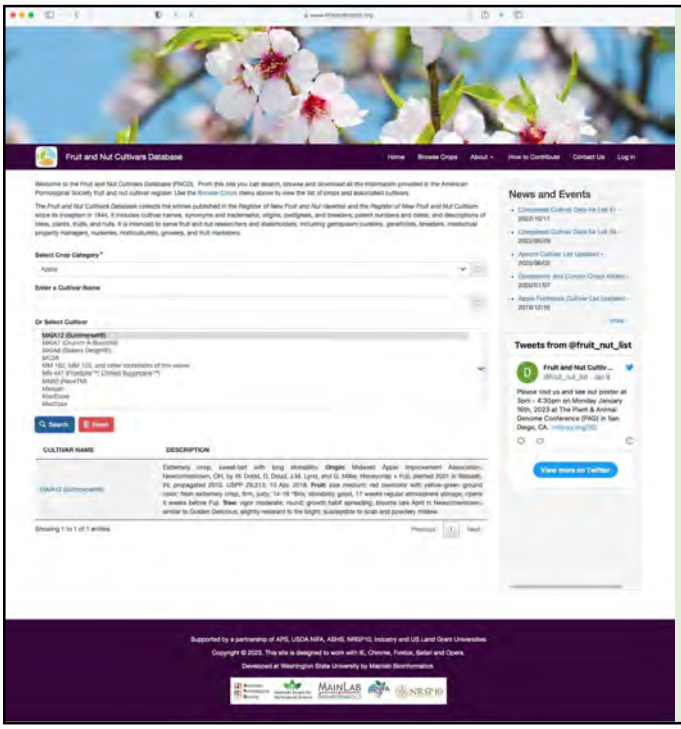
Challenges / Responses: New breeding technologies

- Genetically engineered cultivars introduced so far include 'UH Rainbow' and 'UH SunUp' papayas, 'Rosé' pink pineapple, and four non-browning apples marketed under the Arctic® brand.
- **Challenge**: It's hard to know which GE cultivars exists, how to name and describe them, and when to include descriptions in the Register.
- **Response**: Register editors try to include all GE cultivars that have applied for deregulation; describe "Method of trait development".
- **Problem**: Some, like the Arctic® apples, don't have cultivar names. (Trademarks generally can't be used in cultivar names.)
- **Potential solution**: They do have transformation event codes that can serve as proxy cultivar names: e.g., GD743 = Arctic® Golden Delicious.
- CRISPR-edited cultivars such as a nonbrowning banana (see at left), a GABA rich tomato, and milder mustard greens are already starting to be commercialized. Surely many more will be introduced once the patent and regulatory questions are settled. Register descriptions of these cultivars will have to deal with nomenclature, legal and regulatory aspects, breeding technology, etc.

Challenges / Responses: the Internet



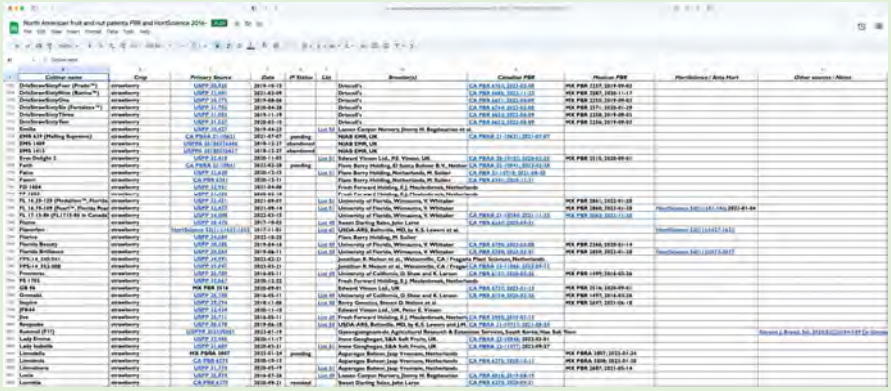
- **Question**: "Who needs the Register? Can't you just find all this information by Googling?"
- **Answer**: "Sometimes, but very often not."
- **Response**: Make sure the Register has unique, original, hard-to-find, and authoritative content.
- For Register List 51, the editors included hyperlinks to the USPTO "master page" for each plant patented cultivar. These links are stable and provide access to all plant patent documents and supplemental material including color photos; they provide updates as patent status changes (i.e., from application to issued patent).
- Technical difficulties with typesetting prevented the hyperlinks from appearing in the PDF, but a Word document with hyperlinks was published as Supplemental Material2. Hopefully the hyperlinks will work in the PDF of List 52.
- In 2016 the editors launched a program to put all the information in the Register online…



Fruit and Nut Cultivars Database

- Searchable online version of the Register, with all content from List 1 (1944) through List 52 (2022).
- Started 2016; finished 2022.
- Obtained by scanning and OCRing Brooks & Olmo 3 book, correcting text, and combining with subsequent Register Lists; this was done by Julia Stover-Blackburn of the UC Davis Fruit & Nut Research & Information Center.
- Hosted by WSU Mainlab Bioinformatics (Katheryn Buble, Doreen Main).
- Project supervised and funded by David Karp.
- Available (open access) at: https://www.fruitandnutlist.org

North American fruit and nut patents PBR and HortScience 2016-



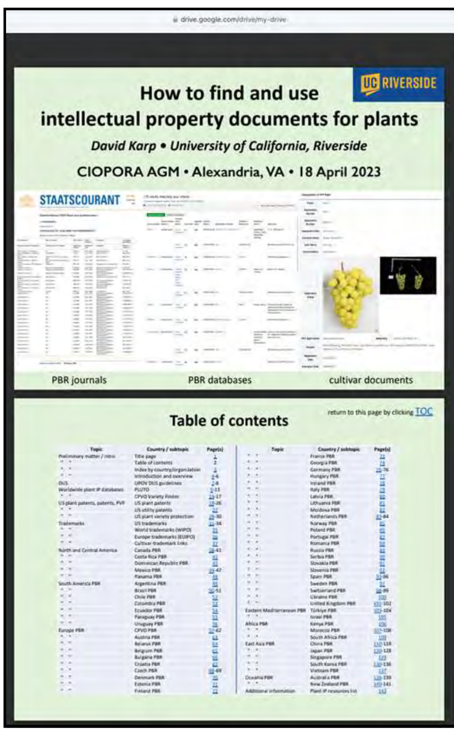
- Spreadsheet of all cultivars with North American plant patents or PBR from 2016, compiled for the Register's editors contributors and editors, to ensure that all cultivars are included, and that previous descriptions are not duplicated.
- Includes cultivar names and trade names; crops; IP sources with links, dates, status; links to Register where description has appeared; breeders; other sources; and notes.

North American fruit and nut patents PBR and HortScience 2016-

Cultivar name	Crop	Primary Source	Date	IP Status	List	Breeder(s)	Canadian PBR
Rexter	almond	USPP 27,367	2016-11-15		List 48	University of Adelaide, M. Wirthensohn; Plant & Food Research, A. Granger	
Lone Star	almond	USPPA 20160088781	2016-03-24	abandoned	—	Burchell Nursery; J.K. Slaughter, T.J. Gordo	
Makako	almond	USPVPA 202100419	2021-06-28	pending	List 51	Consejo Superior de Investigaciones Científicas; F. Dicenta et al.	
Matan	almond	USPVPA 202100483	2021-08-24	pending	List 51	Newe Ya'ar Research Center; Israel D. Holland et al.	
Maxima	almond	USPP 28,433	2016-06-26		List 50	University of Adelaide, M. Wirthensohn; Plant & Food Research, A. Granger	
Mira	almond	USPP 27,673	2018-09-18		List 50	University of Adelaide, M. Wirthensohn; Plant & Food Research, A. Granger	
Pentacebas Cuic (Penta)	almond	HortScience 53(11):1786-1792	2018-11-01		List 51	Consejo Superior de Investigaciones Científicas; F. Dicenta et al.	
PY2	almond	USPP 34,176	2022-05-03			P.M. Yori, Ceres, CA	
Rhea	almond	USPP 29,634	2018-09-04		List 60	University of Adelaide, M. Wirthensohn; Plant & Food Research, A. Granger	
Vela	almond	USPP 30,320	2019-03-26		List 51	University of Adelaide, M. Wirthensohn	
Yorizane	almond	HortScience 56(9):1141-1143	2021-08-18		List 51	USDA-ARS, Parlier, CA; C. Ledbetter	
Lillian CVI	almond rootstock	USPP 27,195	2016-08-30			William Bright and Wendy Bright, Merced, CA	
Sam I	almond rootstock	USPP 27,933	2017-05-02		List 49	P.A. Lewis, Chico, CA	
ALM-754	almond-interspecific	USPP 33,622	2021-11-09			Zaiger's Genetics; G.M. Zaiger et al.	
853505	apple	USPP 33,836	2022-01-11			Summerland Varieties Corp.; Cheryl Hampson	CA PBRA 23-11316 2023-03-28
A 68-173 (Blushing Delight™)	apple	USPP 28,439	2017-09-26		List 50	Peter Braun, Germany	
Allegro (UEB 38026)	apple	USPP 29,990	2018-12-11		List 50	Institute of Experimental Botany, Prague, Czechia; J. Tupy	
Alpigala	apple	USPP 30,081	2019-01-08		List 50	International Fruit Obtention, France; T. Clos	
Anaby 01 (Bravo®) in Australia; Sol	apple	USPP 27,420	2016-11-29		List 49	Department of Agriculture and Food, Western Au	CA PBR 6726 2022-01-06
Ariane	apple	CA PBR 1263	2016-06-10		List 43	INRAE; Marion Guillou	CA PBR 1263 2016-06-10
Arisoo	apple	HortScience 56(7):1139-1141	2021-07-22			Rural Development Administration and Chung-Ang University, South Korea; Young Soon	
Babylove	apple	USPP 32,984	2021-04-13		List 51	Agro Selections Fruits, Elne, France; L. Maillard and A. Maillard	
Bay 4029 (Rubinstiel)	apple	USPP 31,932	2020-07-07		List 51	Hallbergmoos, Germany; M. Neumuller	
Bay 4210 (Sunny Crunch®; Somm	apple	USPP 31,075	2019-11-19			Hallbergmoos, Germany; M. Neumuller	
Bella Rosa (BellaRosa)	apple	USPP 32,830	2021-03-02		List 51	Fruit Varieties International, Grove, Tasmania, Australia; B. Francis	
Bigbucks (Flash Gala™)	apple	USPP 27,285	2016-06-12		List 50	Fink Veio Pty Ltd., Elgin, Western Cape, South Africa; D.A. Corder	
Bingo Gala	apple	USPP 33,285	2021-08-24		List 51	Golden Joy Bingo, Grabouw, Western Cape, South Africa; J.D. Weigman	
BL-19	apple	USPP 27,867	2017-04-11		List 49	Brandon Lewis, Wenatchee, WA	
Bonita (UEB 406/1)	apple	USPP 27,593	2016-12-11		List 50	Institute of Experimental Botany, Prague, Czechia; Radek Cerny et al.	
BPN02 (Juliet®)	apple	USPVP 202000332	2020-07-22			Julie Apple Pty [assignee]; William Kenneth Shields and Julie Lynette Shields, Australia	
Canopy	apple	USPP 34,638	2022-10-11			International Fruit Obtention; Valérie Fouillet	
CAP001	apple	CA PBRA 17-9203	2017-10-06	pending		CAP Farms Inc., Grafton, Nova Scotia; Andrew Pa	CA PBRA 17-9203 2017-10-06
Cherry Parfait 019	apple	USPP 30,932	2019-10-08			Stark Bro's Nurseries & Orchards; Lee Elliott and Mary Elliott	
CIV323 (Isaaq®)	apple	USPP 26,973	2016-07-26		List 48	Consorzio Italiano Vivaisti, Ferrara, Italy; M. Leis et al.	
CIVM49 (RedPop®)	apple	USPP 32,391	2020-10-27		List 51	Consorzio Italiano Vivaisti, Ferrara, Italy; M. Leis and A. Martinelli	
CIVM65 (Dssyl®)	apple	CPVO PBRA 20212361	2022-02-01	pending		Consorzio Italiano Vivaisti, Ferrara, Italy; M. Leis and A. Martinelli	
Civpeak (Rubensill®)	apple	USPP 32,417	2020-11-03		List 51	Consorzio Italiano Vivaisti, Ferrara, Italy; M. Leis and A. Martinelli	

- Recently revised and expanded to make Canadian and Mexican info comprehensive.
- Easily searchable, provides links to cultivars whether they have been described in the Register yet or not, with updated IP details, trade names, etc. A fourth Register format?
- Limited, for the most part, to IP-protected cultivars since 2016, but comprehensive and current, with updated trade names, IP details, and links. Updated weekly. Available at:

https://drive.google.com/file/d/1LtCeTo13PDFsO6AqFSw_1PGo_lvP0VWR/view?usp=sharing



How to find and use IP documents for plants

- serves as a guide to the IP documents and databases maintained by UPOV members
- focuses on three main types of resources available online:

1) National and regional (CPVO) plant variety rights journals (gazettes, bulletins, etc.), and particularly the web pages where they are archived on national and regional plant variety protection websites.
2) National, regional (CPVO Register), and worldwide (UPOV/PLUTO, CPVO Variety Finder) plant variety rights databases searchable online.
3) Official documents regarding individual cultivars, including plant patent and PBR documents, DUS test reports, grant certificates, photos, etc.

- compiled as a PPT to assist Register contributors and editors

Germany PBR – page 2 of 2

sample page from **How to find and use IP documents for plants**

TOC

German Plant Variety Gazettes are at https://www.bundessortenamt.de/bsa/en/variety-testing/official-gazette/official-gazette-archive (1, left). A sample is at center (2) and right (3).

China PBR – page 3 of 10

TOC

translation icon

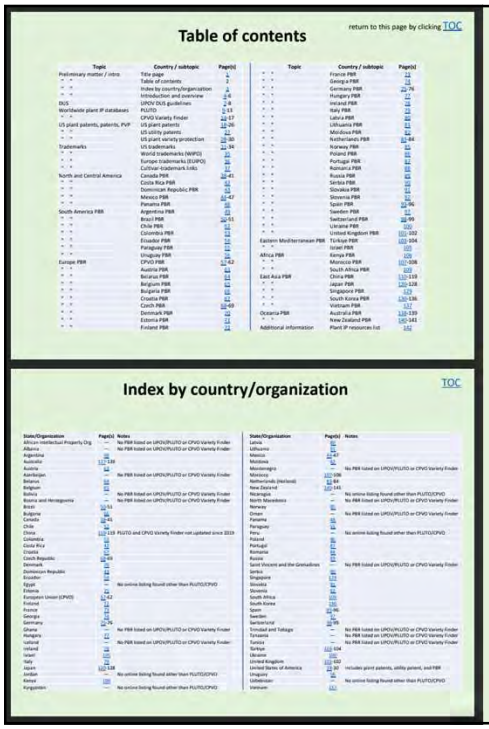
The MARA home page in English is http://english.moa.gov.cn

But the crucial portal for accessing MARA PVR documents is http://www.nybkjfzzx.cn/p_pzbh/sub_gg.aspx?n=21 (at upper right).

It's only in Chinese. Click on the top three buttons at upper left (1, 2, and 3) to access:

1) 品种权申请公告 = PVR application gazettes
2) 品种权授权公告 = PVR grant gazettes
3) 品种权事务公告 = Other PVR info such as application withdrawals, name changes, breeder changes, etc.

Tip: Sometimes links are broken; if so, try Googling the text from the index, such as "2020年9月1日品种权申请公告（总第 127期）" (4) and a working link usually appears.



How to find and use IP documents for plants

- No such resource was publicly available
- Originally published as supplementary material to Register List 52 (Sept. 2022)
- Substantially revised, updated, and expanded (143 pp.) for presentation to CIOPORA (Apr. 2023)
- Hyperlinks in TOC (p. 2) and Index (p. 3) make navigating easy
- publicly available at https://drive.google.com/file/d/1Zj-FF1QPighCcdwebG2mPuU7X_VGuxDZ/view?usp=sharing

Crop-specific pomological databases

- There are virtually no International Cultivar Registration Authorities (ICRAs) for pomological crops.
- But there are many crop-specific pomological databases online, varying in features, comprehensiveness, accuracy, appeal to scientists or laymen, and how updated they are.

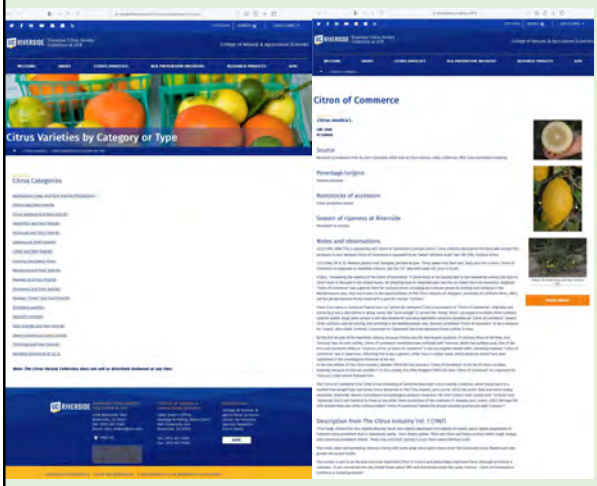

Vitis International Variety Catalogue


Pomiferous


MyBlackberryPlants


UCR avocado variety database

UC Riverside Givaudan Citrus Variety Collection website



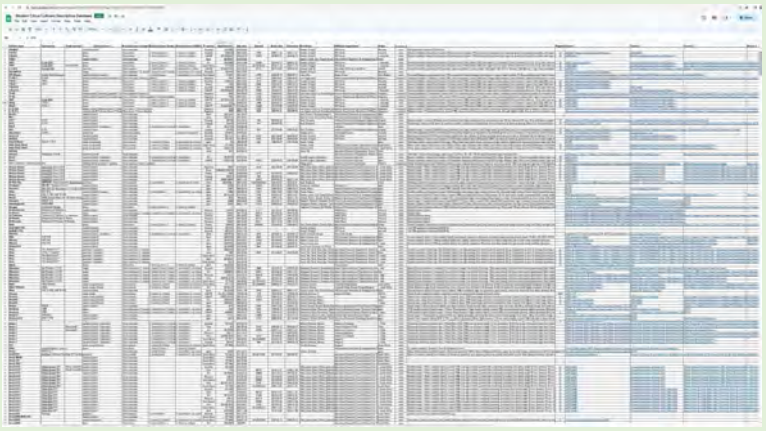
- Displays pages for c. 1,100 publicly available varieties and germplasm
- Searchable by fruit common name or by accession name (cultivar or species)
- Includes: cultivar name, species, CRC #, PI #, CCPP #; source, parentage/origins; rootstocks; season; notes and observations; description from The Citrus Industry; availability; links; photos.
- Started 2006; maintained by T. Siebert, K. Trunelle, T. Kahn, and D. Karp
- Genetic discoveries in the past 2-3 decades have revolutionized understanding of citrus ancestry and organization of categories; waiting for publication of Y. Hiraoka's PhD to update and revise the CVC website.
- https://citrusvariety.ucr.edu

Modern Citrus Cultivars Descriptive Database

- The CVC has only publicly available material. It can't keep a comprehensive collection of protected cultivars from around the world because we'd have to get permission from rights owners; bring in and clean up budwood; raise vast sums to plant and maintain new groves; and protect budwood.
- MCCDD started spring 2020 as a list of all protected citrus cultivars, downloaded from PLUTO. I wanted to know what cultivars existed, which ones should be included in the Register, and which might eventually be included in the CVC when their IP rights expired.
- I started annotating the spreadsheet, and after one year I had compiled a new, multifaceted resource that serves as a potential model for how to build a worldwide pomological descriptive crop database.
- The CVC is the bright side of the moon, covering available cultivars; MCCDD covers the dark side of the moon, cultivars that in many cases can't be studied directly, but about which much can often be learned from PP, PBR, commercial and scientific documents.
- MCCDD is at https://citrusvariety.ucr.edu/modern-citrus-cultivars-descriptive-database

Modern Citrus Cultivars Descriptive Database

MCCDD consists of cultivar names, trademarks, common names (fruit types), botanical names, intellectual property applications and grants, breeders and their affiliations, pedigrees, descriptions of trees and fruits, and bibliographical citations with links. It includes all citrus cultivars for which a plant patent or plant breeders' rights application has been made, from 1931 to the present, as well as many cultivars introduced after 1980 and not described in *Horticultural Varieties of Citrus* (1967) or *Citrus Varieties of the World* (2000). Each cultivar appears on one row for each application in a country for a plant patent or PBR; c. 1,200



distinct cultivars currently are included, and others will be added. This work is international in scope, and includes both scions and rootstocks traditionally classified in the genera *Citrus, Poncirus, Fortunella, Microcitrus, Eremocitrus* and their hybrids.

Information categories

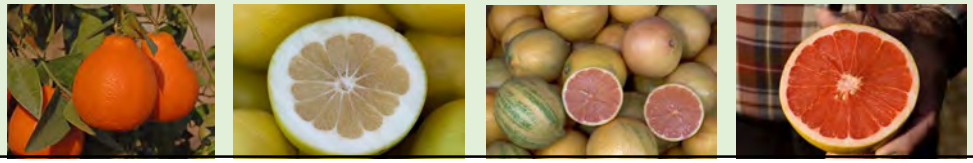
1) Nomenclature and taxonomy
- Cultivar name
- Synonym(s), including foreign script
- Trademark(s)
- Common name
- Botanical names: Swingle & Reece
- Botanical names: Tanaka/USDA

2) Intellectual property
- IP country
- Application #
- Application date
- Grant #
- Grant date
- Expiration

3) Breeding
- Breeder(s)
- Affiliated organization(s)
- Cultivar origin

4) Description
- Scion / rootstock / ornamental
- Description / notes

5) Sources
- Register of New Fruit & Nut Cultivars List
- Source 1
- Source 2
- Source 3
- Source 4



Nomenclature: Synonym(s) and name(s) in original script

- other names for same cultivar
- test names
- original primary cultivar epithet in local script (Japanese, Chinese, and Korean, Hebrew)
- names in original language script are indispensable for any serious consideration of a cultivar
- synonyms that appear elsewhere in list as primary name are underlined: TDE3 = Tai Hao Jin Tde3 (China)
- When appropriate I also provide the English translation of the original Asian name, 'Benimadoka' = 紅まどか = "Red Madoka"

Wonkyoah Danbaiseo	원교아단배성1호
Wonkyoah Danbaiseo	원교아단배성2호
Wonkyoah Danbaiseo	원교아단배성3호 = Wonkyoah Danbaiseong 3ho
Wonkyoahdanbaiseon	원교아단배성4호
Workman Navel	Summernavel
Wu He You Li Ke	Eureka SL; 无核尤力克 = "Seedless Eureka"
Xie Shan	Wakayama; VI 621
Xio	
Yafit	יפית
Yamakawawase	山川早生 = "Yamakawa Early"; Yamakawa
Yamamizaka Navel	山見阪ネーブル; Yamami-han
Yamashitabeniwase	山下紅早生
Yang Guang	阳光 = "Sunshine"
Yanov	יאנוב
Yellow	Yellow Pummelo; Yellow Pomero; イエローポメロ = "Yellow pummelo"
Yellow Bell	イエローベル
Yellow Star Seedless	Lemox, C3869
Yifat	"splendor" = יפעת ; Vol Yifat
YN26	
Yoichiro	陽一郎
Yoko	陽香; Youkou
Yong Hong Ai Wan Y	永紅矮晚柚 = Yonghong Dwarf pummelo
Yosemite Gold	TDE4 (USA, EU, and most other countries); TDE 4 (Paraguay); TDEfour (Israel); You
Yoshinagawase	吉永早生
You Sheng Mei Di Jin	TDE4 (USA, EU, and most other countries); TDE 4 (Paraguay); Yosemite Gold (Chile)
Youkou	
Young Eleven	행가래
Yubeni	勇紅 = "Crimson Courage"
Yumemiraimurakamiw	夢未来村上早生 = "Dream Future Early Murakami"
Yumichannohoppe	ゆみちゃんのほっぺ = "Yumi's Cheek"; Yumichan-no-hoppe
Yurawase	ゆら早生; Yura; Yura Wase
Yuyakehime	夕焼け姫 = "Sunset Princess"
Yuzao	渝早橙 = Yu Zao Cheng
Zahra	Mandarine Zahra
Zenkuro	善九郎
Zhenong Seedless	Zhe Nong Wu He Cheng You
Zhong Gan Suo 5 Hao	中柑所5号; 金秋砂糖桔 = "Golden Autumn Sugar Orange"; Jinqiusha Tangju; CRIC32

Nomenclature: Common names

No one system of categorization serves all purposes:

- for scientists, nurseries, wholesale fresh fruit, retail, processing, phytosanitary regs, trade, ag statistics…
- there are multiple preexisting category assignments, by Florida Fruit Classification and Standards Committee, plant IP authorities (USPTO, CPVO, etc.)

Assigning common names to cultivars I have considered:
1) citrus genetics;
2) morphology, sometimes different from pedigree;
3) convention.

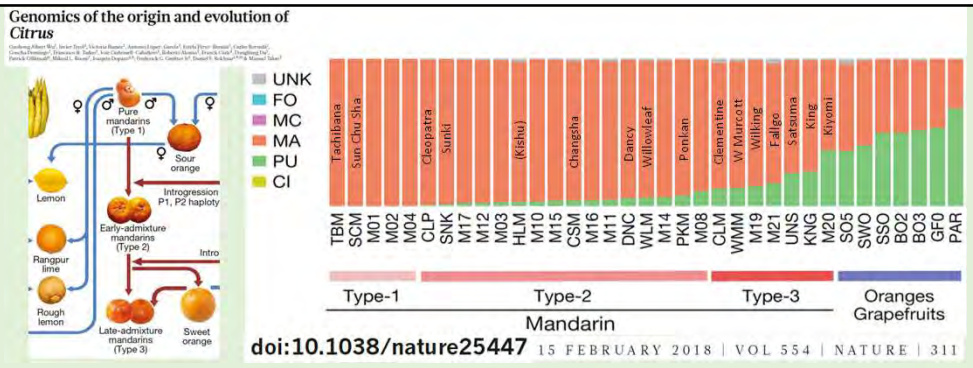
- Purpose: provide citrus scientists, growers, nurseries, marketers, and other citrus stakeholders with basic information concerning what type each cultivar is.
- Aim: logical, consistent, and useful.
- Common names important as taxonomic nomenclature becomes unfamiliar
- Categories and subcategories: "sweet orange-navel", "sweet orange-Valencia", etc.

172	Belalate	mandarin hybrid—satsuma
173	Belasweet	mandarin hybrid—satsuma
174	Beli SL	sweet orange-Valencia
175	Bella	mandarin hybrid
176	Bellini	tangelo
177	Benedetta Dello J	sweet orange
178	Benedicto	lemon
179	Benedicto	lemon
180	Benibae	mandarin hybrid
181	Benimadoka	pummelo
182	Benio	kumquat
183	Benisawaka	mandarin hybrid?
184	Benjamin Andes	lemon
185	Bennie	sweet orange-Valencia
186	Benny	sweet orange-Valencia
187	Bétera	lemon
188	Bingo	mandarin hybrid
189	Bitters	trifoliate hybrid–citrandarin (ma
190	Blushing Lemon	lemon
191	Brasiliano N.L. 92	sweet orange-navel
192	Breegold	lime
193	Brown Select	mandarin hybrid—satsuma
194	BRS Rubra Cara	sweet orange-navel
195	Bruce	mandarin hybrid
196	Burgundy Red	grapefruit
197	C 1867	tangor
198	C 66 75	tangor
199	C37	mandarin hybrid
200	C37	mandarin hybrid
201	C4-15-19	mandarin hybrid
202	California Rojo	sweet orange-navel
203	Callosa	lemon
204	Calnugget	mandarin hybrid
205	Caloma	sweet orange-navel
206	Cambria	sweet orange

Nomenclature: Common names

- When a common name exists for direct hybrids of two types, e.g. tangelo, tangor, I use it.
- When no such name is commonly used, I list the two parent types: pummelo x grapefruit, Rangpur lime × sour orange, etc.
- When a fruit results from a backcross (or series of crosses) in which one fruit type is predominant in genetics and morphology, I call it a hybrid of that predominant type: e.g. mandarin hybrid, lemon hybrid, pummelo hybrid.
- Japanese citrus hybrids, including yuzu, sudachi, kabosu, hyuganatsu, natsudaidai, etc., are each considered to be fruit groups, as are lemon, orange, grapefruit, etc.

	Common name
2	citron-fingered
3	Citrus chimera
4	desert lime
5	finger lime
6	finger lime hybrid
7	grapefruit
8	hassaku x natsudaidai
9	hyuganatsu
10	hyuganatsu hybrid
11	Ichang papeda × pummelo
12	kabosu
13	kumquat
14	lemon
15	lemon × clementine
16	lemon hybrid
17	lemon-Meyer
18	lime-true
19	lime-Persian
20	limelike hybrid
21	mandarin
22	mandarin hybrid
23	mandarin hybrid—acid
24	mandarin hybrid—clementine
25	mandarin hybrid—satsuma
26	mandarin-ponkan
27	mandarin-tachibana
28	mandarinquat
29	natsudaidai
30	orange × pummelo
31	orange hybrid
32	orangelo
33	pummelo
34	pummelo × grapefruit
35	pummelo × mandarin
36	pummelo hybrid
37	sudachi
38	sudachi x yuzu
39	sweet orange
40	sweet orange hybrid
41	sweet orange-blood
42	sweet orange-navel
43	sweet orange-Valencia
44	sweet orange-like hybrid
45	tangelo
46	tangor
47	trifoliate hybrid–citrandarin (mandarin × trifoliate)
48	trifoliate hybrid: citrange (orange x trifoliate)
49	trifoliate hybrid: pummelo × trifoliate
50	Volkamer lemon
51	yuzu



Now for the tricky part: mandarins. According to Wu et al., 2018, Genomics of the origin and evolution of Citrus, the fruits commonly called mandarins fall into three categories:

- Type-1: ancestral mandarins, pure *Citrus reticulata*. These are few and very rare today, especially among recently bred cultivars. Examples: Tachibana, Sun Chu Sha.
- Type-2: early-admixture mandarins contain a small amount of pummelo admixture that can be traced back to a common pummelo ancestor: Cleopatra, Sunki, Kishu, Changsha, Dancy, Willowleaf, ponkan. This is almost certainly what Blanco meant by *C. reticulata*.
- Type-3: late-admixture mandarins contain a larger proportion of introgression from pummelo, and from a greater diversity of pummelo genotypes: clementine, W. Murcott, Wilking, Fallgo, satsuma, King.

After much reflection I have decided to call type-1 “ancestral mandarins”; call type-2 “mandarins”; and call type-3 “mandarin hybrids”.

Comparison of citrus taxonomy systems

	Common name	Swingle and Reece (1967)	Tanaka (1961)	Zhang and Mabberley (2008)	Ollitraut, Curk, and Krueger (2020)	USDA GRIN (Schori)
2	citron	*C. medica* L.	*C. medica*, *C. limonimedica* Lush.	*C. medica* L.	*C. medica* L.	*C. medica* L.
3	pummelo	*C. maxima* Merr.	*C. maxima* Merr.	*C. maxima* (Burm.) Merr.	*C. maxima* (Burm.) Merr.	*C. maxima* (Burm.) Merr.
4	mandarin–Cleopatra	*C. reticulata* var. *austera*	*C. reshni* hort. ex Tanaka	*C. reticulata* Blanco	["needs deeper analysis"]	*C. ×aurantium* L. var. *chrysocarpa* (Hassk.) ined.
5	mandarin–Dancy	*C. reticulata* Blanco	*C. tangerina* hort. ex Tanaka	*C. reticulata* Blanco	*C. × aurantium* var. *tangerina* ined.	*C. ×aurantium* L. var. *chrysocarpa* (Hassk.) ined.
6	mandarin–Kishu	*C. tachibana* Makino	*C. kinokuni* hort. ex Tanaka	*C. reticulata* Blanco	*C. × aurantium* var. *kinokuni* ined.	*C. ×aurantium* L. var. *chrysocarpa* (Hassk.) ined.
7	mandarin–ponkan	*C. reticulata* Blanco	*C. poonensis* Yu. Tanaka	*C. reticulata* Blanco		*C. reticulata* Blanco
8	mandarin–Tachibana	*C. tachibana* Makino	*C. tachibana* (Makino) Tanaka	*C. reticulata* Blanco	*C. reticulata* var. *tachibana* ined.	*C. ×aurantium* L. var. *chrysocarpa* (Hassk.) ined.
9	mandarin–Willowleaf	*C. reticulata* Blanco	*C. deliciosa* Ten.	*C. reticulata* Blanco	*C. × aurantium* var. *deliciosa* ined.	*C. ×aurantium* L. var. *chrysocarpa* (Hassk.) ined.
10	mandarin hybrid–clementine	*C. reticulata* Blanco	*C. clementina* hort. ex Tanaka	*C. reticulata* Blanco	*C. × aurantium* var. *clementina* ined.	*C. ×aurantium* L.
11	mandarin hybrid–King	*C. reticulata* Blanco	*C. nobilis* Lour.	*C. ×aurantium* L.	*C. × aurantium* var. *nobilis* ined.	*C. ×aurantium* L. var. *chrysocarpa* (Hassk.) ined.
12	mandarin hybrid–satsuma	*C. reticulata* Blanco	*C. unshiu* Marcov.	*C. reticulata* Blanco	*C. × aurantium* var. *unshiu* ined.	*C. ×aurantium* L. var. *chrysocarpa* (Hassk.) ined.
13	Ichang papeda	*C. ichangensis* Swing.	*C. ichangensis* Swingle	*C. cavaleriei* H. Lév. ex Cavalerie	*C. cavaleriei* H. Lév. ex Cavalerie	*C. cavaleriei* H. Lév. ex Cavalerie
14	small-flowered papeda	*C. micrantha* Wester.	*C. micrantha* Wester.	*C. hystrix* DC.	*C. micrantha* Wester	*C. hystrix* DC.
15	kumquat–Marumi	*Fortunella japonica* (Thunb.) Swing.		*C. japonica* Thunb.		*C. japonica* Thunb.
16	kumquat–Nagami	*Fortunella margarita* (Lour.) Swing.		*C. japonica* Thunb.		*C. japonica* Thunb.
17	trifoliate	*Poncirus trifoliata* (L.) Raf.		*C. trifoliata* L.		*C. trifoliata* L.
18	desert lime	*Eremocitrus glauca (Lindl.) Swing.*		*Citrus glauca* (Lindl.) Burkill		*C. glauca* (Lindl.) Burkill
19	finger lime	*Microcitrus australasica* (F. Muell.) Swing.		*Citrus australasica* F.Muell.		*C. australasica* F. Muell.
20	round lime	*Microcitrus australis* (Planch.) Swing.		*Citrus australis* (Mudie) Planch.		*C. australis* (A. Cunn. ex Mudie) Planch.
21	grapefruit	*C. paradisi* Macf.	*C. paradisi* Macf.	*C. ×aurantium* L. Grapefruit Group	*C. × aurantium* var. *paradisi* ined.	*C. ×aurantium* L. var. *racemosa* (Risso) ined.
22	lemon	*C. limon* (L.) Burm.	*C. limon* (L.) Burm. f.	*C. ×limon* (L.) Osbeck	*C. × limon* var. *limon* (L.) Burm. f.	*C. ×limon* (L.) Osbeck
23	lemon–Meyer	*C. limon* (L.) Burm.	*C. meyeri* Yu. Tanaka		*C. × limon* var. *meyeri* ined.	*C. ×limon* (L.) Osbeck
24	lime-Mexican, Key, West Indian	*C. aurantiifolia* (Christm.) Swing	*C. aurantifolia* (Christm.) Swingle	*C. ×aurantifolia* (Christm.) Swingle	*C. × aurantiifolia* var. *aurantiifolia*	*C. ×aurantiifolia* (Christm.) Swingle
25	lime-Persian	*C. aurantiifolia* (Christm.) Swing	*C. latifolia* Tan.	*C. ×latifolia* Tanaka ex Yu. Tanaka	*C. × latifolia* var. *latifolia*	*C. ×latifolia* (Yu. Tanaka) Tanaka
26	sour orange	*C. aurantium* L.	*C. aurantium* L.	*C. ×aurantium* L.	*C. × aurantium* L. var. *aurantium*	*C. ×aurantium* L.
27	sweet orange	*C. sinensis* (L.) Osbeck	*C. sinensis* (L.) Osbeck	*C. ×aurantium* L. Sweet Orange Group	*C. × aurantium* var. *sinensis* L.	*C. ×aurantium* var. *sinensis* L.
28	tangelo	*C. sinensis × C. paradisi*		*C. ×aurantium* L.		*C. ×aurantium* L. var. *chrysocarpa* (Hassk.) ined.
29	tangor	*C. sinensis × C. reticulata*	*C. temple* hort ex Y. Tanaka	*C. ×aurantium* L.	*C. × aurantium* var. *temple* ined.	*C. ×aurantium* L. var. *chrysocarpa* (Hassk.) ined.
30	sweet lime	*C. aurantiifolia* (Christm.) Swing	*C. limettioides* Tanaka		*C. × limon* var. *limettioides* ined.	*C. ×lumia* Risso
31	limetta	*C. limon* (L.) Burm.	*C. limetta* Risso		*C. × limon* var. *limetta* ined.	*C. ×limon* (L.) Osbeck
32	rough lemon	*C. limon* (L.) Burm.	*C. jambhiri* Lush.	C. ×taitensis Risso	*C. × limonia* var. *jambhiri* ined.	*C. ×granulata* Raf.
33	rangpur lime	*C. limon* (L.) Burm.	*C. limonia* Osbeck		*C. × limonia* Osbeck var. *limonia*	*C. ×limon* (L.) Osbeck
34	Volkamer lemon	*C. limon* (L.) Burm.	*C. limonia* Osbeck		*C. × limonia* var. *volkameriana* Pasquale	*C. ×limon* (L.) Osbeck
35	calamondin	*C. reticulata* var. *austera* × *Fortunella* sp.	*C. madurensis* Lour.	*C. ×microcarpa* Bunge	*C. × microcarpa*	*C. ×microcarpa* Bunge
36	yuzu	*C. ichangensis × C. reticulata* var. *austera*	*C. junos* Sieb. ex Tanaka	*C. ×junos* Siebold ex Tanaka		*C. ×junos* Siebold ex Tanaka
37	sudachi	*C. ichangensis × C. reticulata* var. *austera*	*C. sudachi* hort. ex Shirai			*C. ×sudachi* hort. ex Shirai
38	kabosu	*C. aurantium* L.	*C. sphaerocarpa* hort. ex Tanaka			*Citrus* spp.
39	hassaku	*C. paradisi* Macf. x *C. reticulata* Blanco	*C. hassaku* hort. ex Tanaka			*C. ×aurantium* var. racemosa
40	hyuganatsu	*C. sinensis* (L.) Osbeck	*C. tamurana* hort. ex Tanaka			*C. ×aurantium* L.
41	natsudaidai	*C. paradisi* Macf.	*C. natsudaidai* Hayata			*C. ×aurantium* L. var. racemosa (Risso) ined.

Description / notes

- This is the most original, challenging, laborious, and important part of the project: a description of the origin, tree and fruit for each cultivar. It follows a framework which is similar to the order in the Register of New Fruit and Nut Cultivars.
- Compiling these descriptions took a lot of time, often an hour of more per cultivar, but if one person assembles this information, it will be readily available to thousands of citrus stakeholders: breeders, researchers, germplasm curators, IP rights purveyors, nurseries, growers, marketers, and anyone curious about modern citrus cultivars.

Cultivar name	Description / notes
Ronit	[illegible]
Rosalina	[illegible]
Rosalina	[illegible]
Rouge La Toma	[illegible]
Royal Late	Tree compact; ripens late, with or 1 week before Wickram. ZA PBR application rejected 2002-06-21
Ru Yi Jie	?
Rubidoux #1	[illegible]
Ruby	[illegible]
Ruby	[illegible]
Ruby Pomelit	[illegible]
Ruby SL	[illegible]
Ruby Valencia	[illegible]
Ruby Valencia SL	[illegible]
Ruby Valencia SL	[illegible]
RubyGS	[illegible]
RubyGS	[illegible]
Saebyeolbong	[illegible]
Safor	[illegible]
Safor	[illegible]
Safor	[illegible]
Safor	[illegible]
Safor	[illegible]
Saga	[illegible]
Sagakashi 34go	[illegible]
Sagakashi 35go	[illegible]
Sagakashi 6go	[illegible]
Sagakashi 9go	[illegible]
Sagakashi35go	[illegible]
Saganta	† ES PBR application withdrawn 1994-03-14
Saint Andre	[illegible]
Sakamura 1go	[illegible]
Sakitsu	[illegible]
Samba	[illegible]
San Hong	[illegible]
San Hong Mi You	[illegible]
Sando	[illegible]
Sangdojasaeng	[illegible]
Sanzo	[illegible]
Sarahyang	[illegible]
Sasakiunshu	[illegible]
Sashika 1go	[illegible]
Sasshu	[illegible]
Sazonokaori	[illegible]

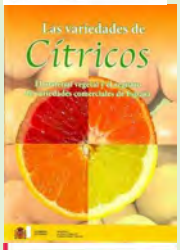
Sources with hyperlinks

	Cultivar name	Source 1	Source 2	Source 3
1	Cultivar name	Source 1	Source 2	Source 3
2	Rishon	USPP 8377	Yaniv, Yossi, and Nir Carmi. 2011. The Israeli Citrus improvement progra	Goldenberg, L., Yaniv, Y., Porat, R. and Carmi, N., 2014. Effects of gamma-ir
3	Rishonit	Israeli Citrus breeding program	Yaniv, Yossi, and Nir Carmi. 2011. The Israeli Citrus improvement progra	Nir Carmi CV
4	RM10			
5	Robertson Navel	USPP 126	UCR Citrus Variety Collection: Robertson	Hodgson, R.W. 1967. Horticultural varieties of citrus. In The citrus industry
6	Robin	Miller, J.E., Breeds, H.J., Maritz, J.G.J. and Froneman, I.J. 1996. Promising Citrus	Sippel, A.D., Bijzet, Z., Froneman, I.J., Combrink, N.K., Maritz, J.G., Hannweg, K.F., Severn-Ellis, A.A. and Manicom, B.Q., 2015. Citrus breeding in South	
7	Robyn	UCR Citrus Variety Collection: Robyn	USDA GRIN: Robyn	Mupambi, Giverson. 2010. Studies to reduce the size of the navel-end openi
8	Rohde Summer Navel	AU Plant Varieties Journal, Volume 11, Issue 1: Rohde Summer Navel	USPP 6733	Chislett Farms cultivar information for Rohde Summer Navel
9	Rojo Blanco	UCR Citrus Variety Collection: Rojo Blanco	USDA GRIN: Rojo Blanco	
10	Roma	Miller, J.E., Breeds, H.J., Maritz, J.G.J. and Froneman, I.J. 1996. Promising Citrus hybrids selected from the South African Breeding Programme. Proc. Int. Soc. Citriculture (1):181-184.		
11	Ronel	Carstens, Karin. 1990. Determination of distinctness among citrus cultivars using biochemical and molecular markers. MS thesis. Rhodes University, p. 41.		
12	Ronit	Israeli Citrus breeding program	Nir Carmi CV	
13	Rosalina	USPP 31258		
14	Rouge La Toma	Foguet, J.L., A.S. Blanco, J.L. González, and H.F. Vinciguerra. 1999. Variedades	Guarrasi, Valeria. 2011. Electronic olfactory system to evaluate the fruit q	Da Graça, J.V., Louzada, E.S. and Sauls, J.W., 2004. The origins of red pigme
15	Royal Late	Citrogold cultivar information for Witkrans	South African export standards for oranges	
16	Ru Yi Jie	China. Announcement of plant variety rights authorization, 2017-05-01: Ruyi orange		
17	Rubidoux #1	UCR Citrus Variety Collection: Rubidoux 1	USDA GRIN: Rubidoux	
18	Ruby	Citrogold cultivar information for Ruby Valencia	Chaires, Peter. 2019. Mission is on to mine blood orange-like variety in Flo	Spain: Start of red-fleshed Ruby Valencia orange harvest. FreshPlaza, 2016-0
19	Ruby	USPP 53	Friend, W.H. 1924. The origin of a superior red-fleshed grapefruit: bud mu	UCR Citrus Variety Collection: Redblush
20	Ruby Pomelit	Sippel, A.D., Bijzet, Z., Froneman, I.J., Combrink, N.K., Maritz, J.G., Hannweg,	Barry, Graham. 2014. Citrus cultivars – their lineage and nomenclature.	
21	Ruby SL	USPP 31794		
22	Ruby Valencia	Citrogold cultivar information for Ruby Valencia	Chaires, Peter. 2019. Mission is on to mine blood orange-like variety in Flo	Spain: Start of red-fleshed Ruby Valencia orange harvest. FreshPlaza, 2016-0
23	Ruby Valencia SL	USPP 31794		
24	RubyGS	USPP 30662		
25	Rusty	AU Plant Varieties Journal, Vol. 30 Number 1: application for Rusty		
26	Saebyeolbong	Park, Jae Ho; Yun, Su Hyun; Park, Suk Man; Koh, Sang Woog. 2017. A new citr	KR PVP application: Saebyeolbong	Woo, Jin-Kyu; Yun, Su-Hyun; Yi, Kyung Uk; Park, Young Chul; Lee, Hye-Yo
27	Safor	Cuenca, J., Aleza, P., Juárez, J., Pina, J.A., Navarro, L., 2010. 'Safor' mandarin: a	USPP 21581	Sdiri, S., Navarro, P., Monterde, A., Salvador, A., Cuenca, J., Aleza, P. and Be
28	Saga	JP PVP	Masao Iwamasa, Japan Fruit Association cultivar information for Saga.	
29	Sagakashi 34go	Yatsuda, S., Matsuo, Y., Nakamura, N., Sakai Ooihara, Y. and Sustsuga, N. 2007	JP PVP	Saga Prefecture cultivar description for Sagakashi 34go mandarin hybrid
30	Sagakashi 35go	Matsumoto, Atsushi. 2020. Saga Prefecture original citrus 'Saga Fruit Test No.	Matsumoto, Atsushi. 2020. Saga Prefecture original citrus 'Saga Fruit Test	JP PVP
31	Sagakashi 6go	Characteristics of the red-based early-maturing Citrus unshiu variety 'Saga Fru	Matsuo, Yoichi et al. 2012. New citrus variety 'Saga Fruit Test No. 6' = 力	JP PVP
32	Sagakashi 9go	Cultivation of a new variety of satsuma mandarin, 'Saga Fruit Test No. 9' = 温	Yield and fruit quality in multi-cultivation of 'Saga Fruit Test No. 9' = '佐賀	JP PVP
33	Sagakashi35go	Matsumoto, Atsushi. 2020. Saga Prefecture original citrus 'Saga Fruit Test No.	Matsumoto, Atsushi. 2020. Saga Prefecture original citrus 'Saga Fruit Test	JP PVP
34	Saint Andre	CGACC cultivar information for Saint Andre	Landbouweekblad 2014-11-28: Hennie Ehlers	
35	Sakamura 1go	JP PVP Gazette	JP PVP	
36	Sakitsu	JP PVP	Japanese PVP Gazette 2005-10-24	
37	Samba	XLnT Citrus to release Samba mandarin in South Africa. FreshPlaza, 2016-05-2	Komati Fruits cultivar information for Samba	
38	San Hong	Zeng Wei L.G. 2016. Biological characteristics and cultivation techniques of Sa	Wang, Y., He, W., Fu, X., Chen, Q. and Wang, X., 2019, October. Effect o	Wang, Y., Fu, X., He, W., Chen, Q. and Wang, X. 2019, December. Effect o
39	Sando	IVIA cultivar information for Sando	Sando Clementine SL	FreshPlaza, 2019-12-13: Sando expands development to South Africa
40	Sangdojosaeng	Park, Young Chul; Oh, Hyun Woo; Kan, Jong Hoon; Lee, Joong Seok; Chin, Se	KR PVP grant: Sangdojosaeng	
41	Sanzo	Caruso, Marco; Perri, Francesco; Russo, Giuseppe. 2016. Sanzo, nuova selezio	Eleuteri, Marco. 2017. Sanzo, variedad tardía 'Made in Italy' que garantiza	Sanzo, the latest clementine variety, makes its official debut. FreshPlaza, 202
42	Sarahyang	Rural Development Administratio cultivar information for Sarahyang	KR PVP application: Sarahyang	Woo, J.-K., Yun, S.H., Yi, K.U., Park, Y.C., Lee, H.Y., Kim, M., Lee, Y., Song,

Kurita, Yukinobu; Susaki, Shizuo; Banno, Mituru; Kato, Minoru; Esaki. Ikuo; Kobe, Hiroo. 2014. Breeding of a new citrus cultivar, 'Yuyakehime' = カンキツ新品種「夕焼け姫」の育成. Research bulletin of the Aichi-ken Agricultural Research Center = 愛知県農業総合試験場研究報告 46:59-66.

Information sources

- US plant patents
- CPVO, Japanese, Australian, Republic of Korea PBR, which when granted include detailed descriptions
- Scientific literature, esp. *HortScience* cultivar articles
- Release notes
- Register of New Fruit and Nut Cultivars descriptions
- International Society of Citriculture Proceedings
- Google translations of foreign material
- Descriptions from citrus books (~275 in my library)
- Notes from 25+ years of citrus research
- Brochures from Citrogold, IVIA, NSW DPI, etc.
- Information sent by breeders



PBR technical descriptions database?

- Potential to streamline the process of searching for "prior art" – cultivars similar to a candidate for a DUS test – by developing a database of DUS variety descriptions (DUSVDs)
- Breeders and IP professionals probably know what is in their state or region, but how do they learn of varieties elsewhere?
- Works like the online Register (Fruit and Nut Database) and the Modern Citrus database, by systematically compiling names, IP details, and descriptions of both public and protected cultivars, could serve as a base for a platform that would integrate DUSVDs.
- If such a platform were implemented for citrus (as a trial example for other crops), it could be useful for streamlining the DUS test process, by allowing applicants and examiners to survey a wide range of prior art from around the world.
- Such a platform might also be useful in enforcing IP rights.

Challenges for a DUS variety descriptions database

- DUS variety description (DUSVDs) formats have varied over the years.
- Some countries do not make DUSVDs public. For example, in the citrus arena, CPVO, Japan, Republic of Korea, Australia, New Zealand, and to some extent Israel do make this information available; but many others do not. Can UPOV authorities obtain DUS test results from national authorities, and if so, to what extent could these be made public? Perhaps a DUSVD database would be accessible only to qualified, registered users.
- DUSVDs from many countries may require translation.
- DUSVDs may not be available during application for and after expiration of PBR.
- Other sources such as plant patents, scientific articles, and commercial brochures contain useful information, but not in the same format as DUSVDs.
- Even if all the necessary information were gathered, devising a database and inputting the information would be a substantial task.
- Persons working on such a resource would need to collectively have experience in pomology, database design, and working with national/regional IP authorities.
- Any such project would be complex and would require buy-in from national plant IP authorities, as well as funding. It might be easier to do a test study for such a project with a crop with fewer IP-protected varieties than citrus.

Links to the Register and related pomological databases

1) Register of New Fruit and Nut Cultivars List 51 (latest)
   https://doi.org/10.21273/HORTSCI.57.9.1174
2) Register of New Fruit and Nut Cultivars archive (Lists 35-51)
   https://www.americanpomological.org/?page_id=25
3) Fruit and Nut Cultivars Database (online Register)
   https://www.fruitandnutlist.org/
4) North American fruit and nut patents PBR and HortScience 2016-
   https://drive.google.com/file/d/1LtCeTo13PDFsO6AqFSw_1PGo_lvP0VWR/view?usp=sharing
5) How to find and use intellectual property documents for plants
   https://drive.google.com/file/d/1Zj-FF1QPiqhCcdwebG2mPuU7X_VGuxDZ/view?usp=sharing
6) UC Riverside Givaudan Citrus Variety Collection
   https://citrusvariety.ucr.edu
7) Modern Citrus Cultivars Descriptive Database
   https://citrusvariety.ucr.edu/modern-citrus-cultivars-descriptive-database

1 2 3 4 5 6 7

Thank you for your attention! Questions?

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