tween Lambert and Jubilee, but its bloom period (Fig. 1) sufficiently overlaps those of Van, Mona, Bing, Larian, Royal Ann, and Berryessa for good cross pollination. Pollination details are given in Table 1.

Bada is excellent for shipping and fresh fruit consumption, as well as for canning and brining. Evidently it may satisfactorily supplement, or even replace, Royal Ann for these markets. The fresh fruit has a long shelf life, remaining glossy with no shriveling of stems for several days at room temperature.

It is felt that Bada could be a good companion cultivar for Berryessa, since their bloom periods coincide well enough for cross pollination and their fruit may be harvested at about the same time. Bada is enough smaller than Berryessa to be more satisfactory for brining.

Propagating wood of these new cultivars may be purchased in limited quantity from the Foundation Plant Materials Service, University of California, Davis. The manager of this service can supply a list of nurserymen handling them. Address all inquiries to: Manager, Foundation Plant Materials Service, Department of Viticulture and Enology, University of California, Davis, California 95616.

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# The Goldmine Nectarine*

ALBERT FARMER†

The discovery of the Goldmine nectarine in a garden in Parnell, Auckland, at the end of the last century, has proved a major contribution to the fruit growing industry of New Zealand. Of all varieties of local origin, it is the best known and most widely grown nectarine variety in other fruit growing regions of the world.

Seedlings from Goldmine have also become important commercial varieties. Since 1921, Goldmine and its named seedlings have been frequently used in the United States and Australia as breeding parents in attempts to improve the nectarine.

The origin of this variety was discussed with the late Hayward Wright, who, at the time of the discovery of Goldmine, was foreman for Messrs. David Hay and Son, nurserymen, Shore Road, Auckland. The origin and description of the variety was subsequently published by the author in the Royal Hort. Society 'Fruit Yearbook' in England in 1955.

According to Wright, this nectarine began as a seedling in the garden of David Lundon, Claybrook Rd., Parnell, Auckland, from a pit imported from Belgium by Ansenne Bros. about 1900. Wright was sent by David Hay to inspect the tree, and Miss Lundon was asked to name the variety.

In their supplementary catalogue of 1897-98, David Hay and Son, Montpellier Nurseries, had this to say about the Goldmine nectarine:

"We have no hesitation in recommending this remarkable new seedling nectarine as superior to all others for productiveness and all-round good

*Adapted from "Fruit and Produce," Sept. 15, 1962, with the permission of the author.

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qualities. The fruit is of enormous size, larger than any nectarine we have hitherto seen, several specimens gathered this summer measuring as much as 9¾ by 7¼ inches. It is a perfect freestone, the pit, or stone, being extremely small for so large a fruit; the flesh is a beautiful cream colour, tender, juicy, melting, and sugary, and of most delicious flavour; colour, bright bronzy red; season of ripening, last week of February. The flowers are large, resembling those of Early Rivers. Habits of tree: extremely vigorous, and most symmetrical in growth and appearance, with very large, dark-green leaves. Another good feature in its growth is that there are no blind buds. We cannot speak too highly of this grand new variety, but we predict this local seedling will take the place among nectarines that Burbank does amongst plums."

It is now over sixty years since that account of Goldmine appeared, and although David Hay's prediction came true, his description was perhaps too flattering. As the variety came to be grown under widely varying conditions, it was inevitable that certain weaknesses would show up. As early as 1921, it was realized that Goldmine had its faults. That year, the University of California started a breeding program with the nectarine. Among the varieties used as parents was Goldmine.

At the Hawkesbury Agricultural College, Richmond, New South Wales, work was under way during the period 1928-1937 to improve Goldmine. Seedlings of Goldmine x Triumph peach produced some promising freestone peach varieties.

By 1937, Goldmine was included in the peach and nectarine breeding material at the U. S. Hort. Station at Beltsville, Md.; the Cal. Agr. Exp. Station, Davis, Cal.; and the N. J. Agr. Exp. Station, at New Brunswick.

**Varieties Developed from Goldmine**

Some of the varieties of nectarine developed from Goldmine are:

**Goldmine Late**—John Brunning, Victoria, Australia, in his 1950 catalog, described this as a sport (presumably of Goldmine). Wilson's Nurseries, Ltd., Hastings, in their 1949 general catalog listed this variety, stating that it was recently imported from Australia, and that it ripens ten days later than Goldmine.

**Surecrop**—H. R. Wright, Avondale, Auckland, in his nursery catalog (about 1914-15) lists this as a variety of his own. Wright told the author that this was a seedling of Goldmine. C. A. Nobelius and Sons Pty. Ltd., nurserymen, Emerald, Victoria, Australia, supported this view in their 1937-38 catalog, stating that Surecrop is a seedling of Goldmine, and closely resembles it in size, flavor, and general appearance. This variety is considered good in eastern United States, and has been used in that country for breeding.

**Nectacrest, Nectaheart** and **Nectarose** were originated by the N. J. Agr. Exp. Station at New Brunswick (M. A. Blake), and introduced in 1947. All three resulted from the following cross: (Garden State x Goldmine x Belle selfed), open pollinated.

**Pioneer** was originated by Herbert Swim in Ontario, Cal. It was introduced as a patented variety in 1949, and assigned to Armstrong Nurseries, Inc., Ontario, Cal. It resulted from (Goldmine x Rio Oso Gem peach) x self.

**Panamint** originated in Ontario, Cal. by Armstrong Nurseries, Inc. Also a patented variety, it was introduced in 1952. It is a cross of (Babcock peach x Boston) x (Goldmine x Rio Oso Gem peach).

**Silver Lode** is another variety originated by Armstrong Nurseries, patented, and introduced in 1951. It is

a product of (Goldmine x Rio Oso Gem peach) x (Goldmine x July Elberta Peach).

### Breeding Characteristics

The nectarine is simply a smooth-skinned peach, but it is one of the most interesting phenomena in horticulture. A single branch originating from a mutant bud of peach, may produce nectarines. Nectarines may come from peach pits, and peaches from nectarine pits. There are no intermediate forms. The "peacharine" exists in the jargon of New Zealand nurserymen, but, botanically, there is no such plant.

Crane and Laurence, in "The Genetics of Garden Plants," have shown that if a true breeding peach is crossed with a nectarine, the first generation are all peaches. But if any of this first generation should be self-pollinated or crossed together, nectarines reappear in the next generation in a ratio of one to four. If a nectarine is self-pollinated or crossed with another nectarine, the resulting seedlings are all nectarines.

Caillavet and Souty, in Monographie des Principales Varieties de Pechers," 1950, describe the Goldmine nectarine in considerable detail. These two French horticulturists consider this variety very beautiful, a good carrier, and an interesting fruit for preserves. They report the vigor of the trees to be good, but that the latter are bad for leaf curl, and only moderately resistant to brown rot.

Goldmine and New Boy are the most widely grown nectarines in Australia, according to Pengelly, in "Varieties of Fruit Trees, Berry Fruits and Vines in Australia," 1957. Goldmine is also considered one of the best varieties grown in South Africa. Since 1958 Goldmine has been the most popular nectarine in New Zealand.

### Blossoms and Fruit

In Auckland, Goldmine is in full bloom September 10-15. Blossoms are deep pink and moderately large. The fruits ripen slightly after the Paragon peach, towards the end of January and the beginning of February. The fruit are medium large, about 2⅜ inches high, and 2⅛ inches in diameter. They are oblong-round, tapering gentley to the apex, which is rounded. Halves are almost equal, but are occasionally assymetrical. The suture is usually shallow. The smooth skin has a pale yellow ground-color, extensively overlaid with dark red wash, which breaks into stippling and fine streaks. Flesh is cream, tinged with red at the pit; melting, fine-grained, very sweet, with a pleasant aroma when ripe, and of excellent flavor and quality. The pit is free and small.

### Tree

Goldmine trees are usually consistent bearers. They often overbear, so that the fruit tends to be small unless heavily thinned. Trees are large and vigorous. Silver Leaf claims many trees, but Goldmine does not seem to be any more susceptible to this disease than most peach varieties. It is more susceptible to brown rot than most peaches, but this disease can be well controlled with properly timed applications of dichlone and captan. Leaf curl and rust can also be a problem unless proper precautions are taken.

To displace Goldmine as the number one nectarine of New Zealand, a variety will have to be larger, brighter colored, and more resistant to brown rot.