

Japanese Apple Varieties

Y. YOSHIDA¹ AND G. I. MINK²

Although commercial apple varieties were not introduced into Japan until the mid-1800's, apples have since become the second leading horticulture crop (1). With nearly 150,000 acres now planted, there is considerable interest in the development of new apple varieties that are better suited to the Japanese preference for sweet, tree-ripened fruit and that are better adapted to intensive cultural practices than many of the "old" American varieties which constitute much of the present acreage. During the past 5 decades more than 50 new varieties have been developed and released by Japanese horticulturists. Most of these varieties were produced from controlled crosses by plant breeders at two research stations located in northern Japan; the Aomori Apple Experiment Station located at Kuroishi City in Aomori Prefecture (state) and the Ministry of Agriculture and Forestry Morioka Branch Fruit Tree Research Station located near Morioka City in Iwate Prefecture. A few apple varieties have been developed by private individuals.

At the present time four varieties ('Jonathan', 'McIntosh', 'American

Summer', 'Pearmain' and 'Ralls Janet') that were imported from the United States nearly 100 years ago comprise two-thirds of the total acreage (Table 1). However, various 'Delicious' sports and 'Golden Delicious' have been planted extensively in recent years. Current trends indicate the 'Delicious' acreage will double in the next few years with a corresponding decrease in the "old" varieties. Of the varieties developed in Japan, 'Fuji' and 'Mutsu' are currently the most popular with growers. However, at least five other varieties are being planted on a commercial scale. These varieties are described below. An additional 19 varieties that are receiving attention are listed in Table 2.

BRIEF VARIETY DESCRIPTION

'Akane' (Tohoku #3)—'Jonathan' x 'Worcester Pearmain' cross. Early season. Brilliant dark red. Small to medium size. White flesh. Less acid than 'McIntosh.' Good quality. Stores 2-3 weeks. Trees somewhat weak with chlorotic mottle of leaves, apparently not caused by virus. (Renamed 'Prima Rouge' in France. Possibly 'Prime Red' in U. S.)

Table 1. Percentage distribution of apple varieties grown in Japan. (1972 data Ministry of Agriculture and Forestry).

	Variety					Others
	"Old" Varieties ¹	Delicious	Golden Delicious	Mutsu	Fuji	
Actual data (1966)	68	16	7	1	1	7
Estimated data (1981)	21	32	8	5	24	10

¹'Jonathan', 'McIntosh', 'American Summer Pearmain', 'Ralls Janet'.

¹Chief plant breeder, Morioka Branch, Fruit Tree Research Station, Ministry of Agriculture and Forestry, Morioka, Japan, and ²Plant Pathologist, Washington State University Irrigated Agriculture Research and Extension Center, Prosser, WA 99350, respectively.

'Aori #2'—'Golden Delicious' parent-age. Early to mid-season. Red stripes. Medium size. Yellow flesh. Juicy. Sweet. Good quality for early apple. Stores about three weeks. Susceptible to bitter pit. Replacing 'McIntosh' in warmer regions. (Synonyms: 'Kogetsu', 'Korin', 'Nishiki', 'Golden Fumei').

'Orei'—'Golden Delicious' x 'Delicious' cross. Mid-season. Yellow. Russet-free. Rectangular to truncate-conic shape. Yellow-white flesh. Firm. Stores well into March. Susceptible to Alternaria leaf blotch. (Synonym: 'Kinrei').

'Sekai-ichi'—'Delicious' x 'Golden Delicious' cross. Mid-season. Red striped. Very large size. Conic shape. Yellow-white flesh. Stores into May. Not recommended because of its extreme size.

'Fuji' (Tohoku #7)—'Ralls Janet' x 'Delicious' cross. Late season. Red

striped. Medium size. Slightly oblong. Light yellow flesh. Firm. Very juicy. Pleasant, aromatic, subacid taste. Excellent quality. Stores until April or longer. Replacing 'Ralls Janet' throughout Japan. Several red-striped and solid red color sports have been found.

'Kensei'—'Golden Delicious' x 'Ralls Janet' cross. Late season. Yellow. Medium to large size. Flesh coarse. Juicy. Sweet aroma. Up to 18% sugar when tree ripe.

'Mutsu'—'Golden Delicious' x 'Indo' cross. Triploid. Late season. Green to golden. Russet-free. Large size. Flesh yellowish-white. Juicy. Fruit developed bright pink color when covered with paper bags from petal fall to 45-50 days prior to harvest. Tree very vigorous. Pollen sterile.

Reference

Mink, G. I. 1973. The Apple Industry in Japan. *HortScience* 8:81-85.

Table 2. Apple varieties developed in Japan.

Variety	Season	Color	Cross	Location
4814018	Early	Red	Tohoku #2 x Red Gold	Morioka
Tohoku #2	Early	Red	McIntosh x Worcester Pearmain	Morioka
Aori #1	Middle	Dark Red	Jonathan x McIntosh	Aomori
J. G.—39	Middle	Red	Jonathan x Golden Delicious	Morioka
Kyokko	Middle	Red	Ralls Janet x McIntosh	Aomori
Shinko	Middle	Red	Ralls Janet x Jonathan	Aomori
Shinsei	Middle	Yellow	Golden Del. x E. McIntosh	Aomori
Amanishiki	Late	Purple-red	Ralls Janet x Indo	Aomori
Aori #3	Late	Red	Jonathan x McIntosh	Aomori
Fkunishiki	Late	Dark Red	Ralls Janet x Delicious	Aomori
Fukutami	Late	Red	Jonathan x Ralls Janet	Aomori
Golden Melon	Late	Yellow	Golden Delicious x Indo	Aomori
Horei	Late	Red	Ralls Janet x Golden Delicious	Aomori
Indo	Late	Red-brown	chance seedling	Private
Korei	Late	Yellow	Golden Delicious x Indo	Aomori
Megumi	Late	Red stripe	Ralls Janet x Jonathan	Aomori
Murasaki	Late	Purple-red	Jonathan x Delicious	Aomori
Shin Indo	Late	Red-brown	Indo x Golden Delicious	Aomori
Toko	Late	Yellow	Golden Delicious x Indo	Aomori