Performance of Selected New Late Season Apple Cultivars in Tennessee

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Several new late season apple cultivars have been developed in recent years. A commercially acceptable cultivar must have many desirable characteristics. They include acceptable fruit appearance and flavor, good yielding ability, moderate disease resistance, and acceptable keeping characteristics in storage. Way (5) lists the 13 commercially important cultivars in the U. S. as Delicious, Golden Delicious, McIntosh, Rome Beauty, Jonathan, York Imperial, Stayman, Winesap, Cortland, Yellow Newton, R. I. Greening, Northern Spy, and Gravenstein. Several new cultivars have the potential to replace some of these cultivars.

The University of Tennessee Plateau Experiment Station has been evaluating apple cultivars since 1950. Performance of cultivars planted prior to 1967 has been published (4). Performance of late ripening cultivars planted between 1967 and 1972 will be discussed here.

The test site is at 1900 ft. elevation. The cool summer and fall temperatures favor development of good fruit color and flavor. Fluctuating winter temperatures and early fall freezes have damaged cultivars that were not winter hardy. Late spring frosts have occasionally reduced fruit production. The average annual rainfall is just over 50 inches and distribution is good throughout most of the year. The humidity and temperature conditions are favorable for apple scab and fireblight development. The soil type is Hartsells sandy loam with a depth of 2.5 to 3.0 ft. to bedrock at the orchard site.

Eleven new late season apple cultivars planted between 1967 and 1971 including rootstocks, year of planting and number of trees are listed in Table 1. Ten of the cultivars are on MM 106 rootstock and Empire is on M. 7 rootstock. Both rootstocks have resulted in early production. The MM 106 has performed well on the sandy soil having good drainage. The M. 7 has performed well when supported to prevent breakage at the graft union and pulling out of the ground during the first 10 years.

Bloom and harvest dates, number of fruiting years and yields per tree are shown in Table 2. Performance of each cultivar will be discussed.

Primegold. Three trees of Primegold (on MM 106 rootstock) planted

Table 1. Year set, rootstock, and number of trees set of 11 late apple cultivars tested at the Plateau Experiment Station, 1967-1978.

Cultivar	Year set	Rootstock	No. trees
Primegold	1971	MM 106	3
Jonnee	1968	MM 106	2
Holiday	1968	MM 106	2
Spijon	1968	MM 106	2
Starkrimson Delicious	1969	MM 106	7
Smoothee	1968	MM 106	2
Empire	1967	M. 7	2
Jonagold	1968	MM 106	2
Thewgold	1972	MM 106	4
Sungold	1969	MM 106	2
Imperial Stayman	1968	MM 106	2

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in 1971 grew poorly and died within six years of planting. This Golden Delicious type apple was quite firm and free of russet. Flavor was fair to poor. Yields were very low and the trees lacked vigor.

Jonnee. Two trees of Jonnee, a dark red strain of Jonathan (on MM 106 rootstock) were set in 1968. Fruit had bright red color and was very tart in flavor. The trees yielded well early, but fireblight was severe in 1976. Both trees were removed in 1978 due to severe fireblight damage. Jonathan was quite susceptible to fireblight in previous plantings.

Holiday. Two trees of Holiday (on MM 106 rootstock) were set in 1968. Holiday is a cross of Macoun x Jonathan and was released in 1964 by the Ohio Agricultural Experiment Station (2). Fruit were medium to large in size and and shaped flat like McIntosh. Fruit color and flavor has been fair to good. Trees have yielded extremely well but seemed to have low vigor in 1977 and 1978. Bark was also extremely rough as tree vigor was reduced. Holiday has some value but has not been outstanding in the trials.

Spijon. Two trees of Spijon (on MM 106 rootstock) were set in 1968. This cultivar was released in 1968 by the New York Agricultural Experiment Station as a cross of Red Spy x Monroe (1). It was released as a processing cultivar. Fruit color and flavor have been poor in the trials. Yields have been good. Spijon may be useful for processing, but doesn't seem to have value as a fresh market cultivar.

Starkrimson Delicious. Seven trees of Starkrimson Delicious (on MM 106 rootstock) were set in 1969. This is a spur-type sport of Red Delicious that was released by a commercial nursery in the late 1950's. These trees have produced attractive bright red fruit. However, flavor has not been as good as that of standard Red Delicious. Starkrimson Delicious had good yields. It has become a widely grown commercial cultivar (3) and serves as a good comparison for the other cultivars in the test.

Smoothee. Two trees of Smoothee (on MM 106 rootstock) were set in 1968. This cultivar was introduced (as a russet resistant Golden Delicious

Table 2. Bloom date, harvest date, number of fruiting years and yields of 11 late apple cultivars tested at the Plateau Experiment Staion, 1967-1978.

Cultivar	Mean bloom date	Mean harvest date	No. fruiting years	Yield— bu./ tree/yr.
Primegold	Apr. 21	Sept. 7	3	0.2
Jonnee	Apr. 18	Sept. 7	5	2.1
Holiday	Apr. 16	Sept. 12	7	4.2
Spijon	Apr. 19	Sept. 21	7	3.0
Starkrimson Delicious	Apr. 17	Sept. 22	8	2.8
Smoothee	Apr. 20	Sept. 23	8	3.8
Empire	Apr. 16	Sept. 25	7	3.0
Jonagold	Apr. 19	Sept. 25	8	3.1
Thewgold	Apr. 21	Sept. 25	3	2.2
Sungold	Apr. 17	Sept. 26	7	2.4
Imperial Stayman	Apr. 19	Sept. 28	7	3.2

strain) in the 1960's. Fruit has been very similar to Golden Delicious and has been practically free from russet in the test. Yields have been quite good compared to the other cultivars. Smoothee has appeared outstanding as a russet resistant strain on Golden Delicious. Smoothee is rapidly becoming a commercial cultivar in areas where fruit russet is a problem with Golden Delicious (3).

Empire. Two trees of Empire (on M. 7 rootstock) were set in 1967. Empire was released in 1966 by the New York Agricultural Experiment Station and is a cross of McIntosh x Delicious (1). Fruits have had a full dark red color, white flesh, flat shape and excellent flavor. Fruit size has been medium to small. Yields have been fair. Empire is rapidly becoming a commercial cultivar (3, 5). Performance was outstanding in this trial.

Jonagold. Two trees of Jonagold (on MM 106 rootstock) were planted in 1968. This cultivar was released by the New York Agricultural Experiment Station in 1968 and is a cross of Golden Delicious x Jonathan (1). Fruit has had the shape of Golden Delicious. Flavor has been outstanding. Fruit finish has been very good but the rose color is a disadvantage for the cultivar. Jonagold may become widely used for local sales but probably will not become a packing cultivar due to the weak color. Jonagold is reported to be a triploid cultivar with infertile pollen (1).

Thewgold. Four trees of Thewgold (on MM 106 rootstock) were set in 1972. This cultivar was introduced in 1966 by a commercial nursery as a Golden Delicious type cultivar. Fruit of Thewgold have been large, very firm with good flavor and appearance. Fruit finish has been smooth and color has been a pink blush over yellow ground color. Most fruit produced was severely infected with *Botyosphaeria* rot. None of the other 50 cultivars in the orchard have had fruit damaged by this rot. Rot susceptibility is a severe problem with this cultivar that has many outstanding features.

Sungold. Two trees of Sungold (on MM 106 rootstock) were set in 1969. This cultivar was released by a commercial nursery in the mid 1960's and is thought to be a natural cross between Delicious and Golden Delicious. The fruit has had the Delicious shape and the Golden Delicious color. Fruit have been very attractive and flavor has been excellent. Trees have had little vigor and yields have been only fair. Part of the low production may be due to a stunting of the trees by over production of fruit. Sungold has shown a need for thinning to prevent overproduction and maintain fruit size. Overall, Sungold is a promising new cultivar.

Imperial Stayman. Two trees of Imperial Stayman (on MM 106 rootstock) were set in 1968. This cultivar was released as a crack resistant Stayman. It has appeared identical with Stayman and has cracked rather badly. Stayman and Imperial Stayman are not suggested for production in Tennessee due to the fruit cracking problem.

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