

PLUMS FOR SOUTHWEST FLORIDA

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Abstract. Low-chill Japanese-type plum (*Prunus salicina* Lindl.) Genotypes have been developed and are adapted to the subtropical conditions in south Florida. The first of these were 'Gulfgold' and 'Gulfruby'. Two recent selections with improved tree and fruit characteristics are 'Gulfbeauty' and 'Gulfblaze'. These varieties vary from 150 to 250 chill units, ripen from mid-April through mid-June, and have fruit size ranging from 35 to 60 g. 'Gulfruby', 'Gulfbeauty', and 'Gulfblaze' have red skin color and bright yellow to orange flesh, sweet flavor, firm texture and may have some bitterness in the peel. Fruit quality is good but these plum varieties are thought to be limited to local markets and commercial u-pick and are also suited for the home garden and landscape.

Growing low-chill, high quality Japanese-type plums (*Prunus salicina* Lindl.) in central and south Florida is appealing to homeowners and landscapers, but could command a high price for commercial u-pick and local markets because the fruit would ripen with commercial low-chill peach, blueberry, blackberry, and raspberry varieties. These fruit would ripen before the earliest high-chill varieties from California, therefore could be economically advantageous.

The Low-Chilling Stone Fruit Breeding Program in Gainesville, at the University of Florida, has developed plums adapted to the subtropical climatic conditions of central and south Florida. Varieties 'Gulfgold' (yellow skin) and 'Gulfruby' (red skin) were bred by individuals at the University of Florida. These varieties are currently recommended for home gardens of central Florida (Sherman and Lyrene, 1985). A third cultivar, 'Hypoluxo' is an open-pollinated seedling of 'Gulfruby' which was named and patented by Steve Farnsworth of Miami.

Two additional varieties, 'Gulfbeauty' and 'Gulfblaze', have been recently released (and patented) by the University of Florida, and may be adapted for use in south Florida. The 'Gulfruby', 'Gulfbeauty', and 'Gulfblaze' have a low-winter dormancy requirement of about 150-250 chill units and 'Gulfgold' about 350 chill units (Topp and Sherman, 1990; Sherman and Lyrene, 1998). One chill unit is believed to equal about one hour of exposure to an optimum temperature near 45 degrees Fahrenheit, and allowing some chilling acquisition to occur in low-chill varieties at temperatures several de-

grees above 45. Never the less, inadequate chilling results in delayed and erratic flowering and reduced fruit set.

These plums have a high heat requirement, following chilling accumulation, to promote spring flowering. In higher chill areas (such as the central valley of California) they flower two weeks after the earliest high chill plums, but in lower chill areas (such as in Gainesville) they flower two weeks before these same high chill plums. Thus, our estimates of chilling requirement may be biased on the high side of actual chilling requirement.

Chill requirements for these plum varieties are low, but they must be tested in new locations before final recommendations can be made (Topp and Sherman, 1989). Climatic adaption, insect, and disease pressures vary at different locations. This paper reports the performance and characteristics of these commercially available varieties in southwest Florida and the potential for their use in the home-garden landscape and commercial u-pick operations and local markets.

Materials and Methods

Varieties 'Gulfgold', 'Gulfruby', 'Hypoluxo', 'Gulfbeauty' (Fla. 85-1), and 'Gulfblaze' (Fla. 87-7) were budded to 'Floradaguard' peach rootstock and planted in a southwest Florida landscape near Fort Myers (latitude 26°39'25"N, longitude 81°45'08"W) in 1993. Trees were spaced 12 feet apart in a row, fertilized with a dry soluble complete fertilizer blend 3 to 5 times/year, irrigated with a lawn watering system or microsprinklers, and a weed free area maintained beneath the canopy with Roundup herbicide. Trees were pruned to establish an open center and topped to maintain a maximum height of eight feet. Bloom and fruit maturity dates were noted and fruit were lightly thinned, allowing overcropping to occur. Fruit were harvested when skin color was red (yellow for 'Gulfgold') indicating tree ripe while still firm. Observations were made of fruit yield, skin color, flesh color, fruit size, fruit firmness, taste, and tree growth. Observations were also made of insect and disease pressure to fruit and tree.

Results and Discussion

Trees of plum varieties 'Gulfgold', 'Gulfruby', 'Gulfbeauty', 'Hypoluxo', and 'Gulfblaze' produced fruit characteristic of the respective varieties and produced good crops in southwest Florida in 1995, 1996, and 1997. Table 1 shows tree and fruit characteristics of these four varieties and Hypoluxo. All varieties had fruit with diameter of 1.5 inches or larger. 'Gulfgold' consistently produced fruit of 2.0 inch diameter and most of the 'Gulfruby' fruit approached this size. 'Gulfbeauty' fruit were slightly less in diameter than 'Gulfruby', and 'Gulfblaze' averaged about 1.5 inches. Fruit of these varieties have red to purple peel when ripe and yellow to orange flesh. Some peel bitterness and acidity may be detectable and all have firm edible flesh which is clingstone.

Flowering usually occurs in February and first fruit (depending on variety) mature 75 to 105 days later. Although there was some flowering in the fall and during warm periods in December or January, sufficient flower buds remain to pro-

Table 1. Tree and fruit characteristics of low-chill subtropical plum varieties grown in southwest Florida. Ratings compiled from observations and published sources (Sherman and Lyrene, 1998; Sherman et al., 1992; Strong and Byrne, 1995).

Variety	Tree type ^a	Chill ^b units	Bloom date	Maturity date	Fruit wt. (g)	Skin color ^c	Flesh color ^c	Firmness ^c	Shape	Attractiveness	Taste	Bacterial spot resistance	Leaf scald resistance
Gulfruby	S	250	10-18 Feb.	late-Apr May	45-50	R	Y	5	round	excellent	sweet-subacid	susceptible	resistant
Hypoluxo	U	200	3-12 Feb.	late-Apr May	50-55	RG	Y	4	elliptic	good	sweet	very susceptible	moderate
Gulfbeauty	U	200	9-13 Feb.	late-Apr May	30-40	R	Y	7	round	good	subacid	resistant	high resistance
Gulfblaze	I	250	9-12 Feb.	mid-late May	50-60	R	O	8	round	excellent	sweet-subacid	resistant	high resistance
Gulfgold	I	350	10-16 Feb.	mid-late June	60-70	Y	Y	6	round	excellent	sweet	excellent	very susceptible

^aU = upright, I = intermediate, S = spreading.

^bOne chill unit = one hour of chilling at an optimum temperature usually thought to be near 45°F.

^cR = red, Y = yellow, G = green.

^cY = yellow, O = orange.

^cRated 0-4 = very poor to poor, 5-6 = marginal to good, 7-9 = excellent for commercial use.

duce a full crop, and most premature flowering did not persist to produce fruit. Fruit of 'Gulfruby' and 'Gulfbeauty' mature late April and early May. Fruit of 'Gulfblaze' mature in mid to late May and 'Gulfgold' early June. Fruit hang on the tree only 3 to 5 days after becoming tree ripe and fall to the ground.

The chilling requirement for these varieties is relatively low (estimated at 150 to 300 units) making them adapted to the mild winters and subtropical climate conditions of south Florida. The varieties received adequate chilling in the three winters they were observed and produced excessive fruit that required thinning. These varieties also have a high heat requirement for breaking dormancy, which could reduce the tendency to over flower prematurely.

These varieties are not self-fruitful and require a pollinizer tree of another plum variety. These varieties are all cross-fruitful, have viable pollen and similar bloom dates, and can serve as pollinizers for each other (Richards et al., 1992).

Pest problems were primarily due to diseases. The widely distributed disease of peaches and plums known as bacterial leaf spot [*Xanthomonas campestris* pv. *pruni* (Smith) Dye] was present on leaves of all varieties but only caused leaf loss on 'Gulfruby'. Another damaging disease of plums is leaf scald (*Xylella fastidiosa* Wells et. al.) Leaf scald, caused by a small bacterium, results in leaf margin necrosis and leaf defoliation during the summer. Leaf scald was not seen on any of the varieties, possibly because of a lack of susceptible hosts in southwest Florida. A disease more likely to be limiting to plums in south Florida is leaf rust [*Tranzschelia prunispinosae* (Pers.) Diet.] which results in early fall defoliation of peaches and plums in areas that have rainy summers. This disease builds up quickly after harvest when the summer rainy season begins in mid-June in south Florida. All varieties were susceptible and 'Gulfruby' and 'Gulfgold' appeared to be more damaged than 'Gulfbeauty' or 'Gulfblaze'. It was not uncommon for the tree to defoliate in August or September and produce bloom when re-foliating before the winter.

Insect pests were not observed to be a problem. Plant bugs (*Leptoglossus spp.*) like the leaf-footed bug and citron bug, and

stink bug (*Nezara viridula*, L.) were observed in the spring during fruit development. Plum curculeo (*Conotrachelus nenupar*, Herbst) has not been observed. Sap beetles were only observed in fruit that became over ripe while still on the tree. Caribbean fruit fly (*Anastrepha suspensa*) is common in south Florida but has not been observed in any plum fruit to date. Perhaps the earliness of the crop maturity has benefitted the escape from this pest. More than any other pest, damage observed from birds was most severe. Birds were attracted to the fruit as the peel color developed and they were induced to peck holes in the fruit rendering it inedible and causing it to begin rotting on the tree or fall to the ground. Potentially the whole crop could be lost to birds, and bird netting was used in 1997 on 'Gulfbeauty' to obtain harvestable fruit.

In summary, these plum varieties can be successfully grown and fruited in south Florida. They have fruit of good size, appearance and firmness, and warrant further use in the development of fruit varieties for the landscape and are acceptable for commercial u-pick operations. Due to their performance in south Florida they may also be successful in other subtropical climate areas. Trees are available in garden centers throughout the State, but due to the recent release of budwood of 'Gulfbeauty' and 'Gulfblaze' these may be in short supply until winter 1998-99.

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