

## Rootstocks for Florida Peaches, Nectarines, and Plums <sup>1</sup>

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Like most other tree crops in Florida, stone fruit are grown on rootstocks that provide disease and pest resistance or other advantages in tree and fruit quality. Although a large number of rootstocks are available for stone fruit in other locations and climates, only 'Flordaguard' peach rootstock is currently recommended for stone fruit production in Florida. Intended for commercial nurseries and growers, this publication provides information about (1) 'Flordaguard' rootstock, (2) other rootstocks no longer recommended for Florida stone fruit and (3) procedures for harvesting, cleaning, and stratifying 'Flordaguard' seed prior to planting.

'Flordaguard', a red-leafed peach rootstock, was released by the University of Florida in 1991. A copy of the original circular, S-376, can be found on the Florida Peach Website at <http://www.hos.ufl.edu/jjfnweb/peach/index.htm>.

'Flordaguard' is recommended for low-chill peach, nectarine, and plum production in non-alkaline soils infested with root-knot nematodes. It has a chilling requirement of about 300 chill units and usually blooms at Gainesville, Florida in early February. However grafted trees grow and produce

well as far south as Immokalee, with about 100 chilling hours, indicating it will also bloom and set fruit with fewer chilling hours and warmer temperatures than occur in Gainesville.

Trees are precocious, often fruiting the second year, and produce many self-fertile flower buds. Trees have long whippy growth (Figure 1) and branches should be supported to bear heavy crop loads. The red- leaf trait of 'Flordaguard' rootstock allows easy detection of rootstock sprouts for removal (Figure 2). Rootstock sprouts should be cut carefully with pruning shears to prevent resprouting and prevent bark injury. Note that 'Flordaguard' rootstock is susceptible to bark gummosis or gumming (Figure 3) incited by the fungal pathogen *Botryosphaeria dothidea*. Accordingly, scion cultivars budded on 'Flordaguard' rootstock should be propagated as low as possible to reduce the amount of exposed, susceptible stem tissue.

'Flordaguard' is a self-pollinating genotype as are most peaches. Out-crossing rates in peaches are typically around 5%. Out-crossed plants should be culled when seedlings are approximately 6 inches tall. True to type seedlings arising from self-pollination

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2. J. Ferguson and J. Chaparro, Horticultural Sciences Department, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, FL 32611. **The use of trade names in this publication is solely for the purpose of providing specific information. UF/IFAS does not guarantee or warranty the products named, and references to them in this publication does not signify our approval to the exclusion of other products of suitable composition. All chemicals should be used in accordance with directions on the manufacturer's label. Use pesticides safely. Read and follow directions on the manufacturer's label.**

have dark red foliage and out-crossed seedlings have reddish green foliage.

Trees of 'Flordaguard' should be trained to an open center, like other peach and nectarine trees. Detail pruning can be done to remove dead or diseased limbs. Trees can set heavy crops but fruit do not have to be thinned to produce viable seeds. Fruit harvesting, seed cleaning, and stratification procedures are described in Table 2. Dull red-colored fruit (Figure 4) ripen in late June, about 130 days after bloom.

Flordaguard is not recommended for use in alkaline soils. Iron deficiency symptoms commonly occur under alkaline conditions (a pH greater than 7.0) in calcareous soils (containing calcium and magnesium carbonates).

Root-knot nematodes (*Meloidogyne incognita* and *Meloidogyne javanica*) have historically been the predominant species of root-knot nematodes and peach rootstocks like 'Nemaguard', 'Nemared', and 'Okinawa' are resistant. However, in 1966 a new species of root-knot nematode, *Meloidogyne floridensis*, was detected on Nemaguard and Okinawa peach rootstock in Gainesville, Florida. This nematode reproduces abundantly on 'Nemaguard' and 'Nemared' peach rootstocks (Table 1) and also on other crops (verbena, eggplant, squash, basil, impatiens, tomato, snapdragon and dill). Consequently, 'Nemaguard', 'Nemared', and 'Okinawa' peach rootstock are no longer recommended for peaches, nectarines and plums in Florida. 'Nemaguard' and 'Nemared' rootstocks have been used in north Florida for many years, but continued use may increase nematode populations to damaging levels on these rootstocks.

'Flordaguard' rootstock, has improved resistance to *Meloidogyne floridensis* compared with 'Nemaguard' rootstock. Field evaluation of peach rootstocks to different root-knot nematode species indicated that after 25 months, nematode egg production was almost 11 times greater on 'Nemaguard' than on 'Flordaguard' rootstock. Longer term observations in Florida also suggest that older trees on 'Nemaguard' rootstock do not perform well in soils infested with *Meloidogyne floridensis*. Accordingly 'Flordaguard' rootstock is the only

rootstock currently recommended by the University of Florida.

When 'Flordaguard' seed is in short supply, some nurseries root 'Flordaguard' stem cuttings. Cuttings less than 1/2 inch in diameter can be taken from a stem just woody enough to support itself. Cuttings are then placed under greenhouse mist systems for rooting. The rooting pattern of stem cuttings may be different from that of seedlings but preliminary research has shown that 'Flordaguard' rooted cuttings perform as well as seedling rootstocks.

To ensure that cuttings being propagated are nematode resistant, stem cuttings should be taken from grafted 'Flordaguard' trees ('Flordaguard' trees grafted or budded onto 'Flordaguard' rootstock) rather than from 'Flordaguard' seedlings. Stem cuttings taken from 'Flordaguard' seedlings may have greater variability in terms of nematode resistance than stem cuttings taken from grafted 'Flordaguard' trees. Seedling trees can originate from the pollination of 'Flordaguard' blossoms by pollen from other cultivars resulting in the loss of nematode resistance in these seedlings. Nurseries should therefore plant their grafted 'Flordaguard' trees, from which seeds are taken, in isolation from other peach trees to reduce out crossing. If field-grown plants are to be sold or shipped, nursery site approval is required by the Division of Plant Industry to prevent spread of burrowing nematode. A production schedule for nursery practices is listed in Table 1.

Trees on 'Nemaguard' and 'Nemared' rootstocks, especially in central and south central Florida, can also be affected by "Spring Shock", a disorder characterized by delayed bud break and poor leaf development after bloom. This disorder has been associated with planting scions with a low chilling requirement on budded rootstocks with high chill requirements in locations with low soil temperatures during bloom and leafing.

## References

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**Figure 1.** A Flordaguard peach tree with red leaves and long whippy branches.



**Figure 2.** A recently planted peach nursery tree with red-leafed Flordaguard rootstock sprouts.



**Figure 3.** *Botryosphaeria gummosis* on Flordaguard seed-source tree grafted onto a Flordaguard rootstock.

**Table 1.** Chilling requirement, leaf color and nematode resistance for four peach rootstock cultivars.

<b>Cultivar</b>	<b>Chilling Requirement</b>	<b>Leaf Color</b>	<b>Meloidgyne incognita</b>	<b>Meloidgyne javanica</b>	Meloidgyne floridensis
Flordaguard	300	Red	Resistant	Resistant	Resistant
Nemaguard	825	Green	Resistant	Resistant	Susceptible
Nemared	650	Red	Resistant	Resistant	Susceptible
Okinawa	100	Green	Resistant	Resistant	Tolerant

**Table 2.** Suggested schedule for peach nursery practices.

<b>June, Year 1</b>	<b>November, Year 1</b>	<b>Late January-February, Year 2</b>	<b>February-June, Year 2</b>	<b>May-June, Year 2</b>	<b>December (Year 2) - January</b>
<p>Harvest Flordaguard seeds from grafted Flordaguard trees. Remove fruit flesh and dry pits at room temperature for 3-4 days. Store pits under dry conditions in a paper bag at 45°F. Pits dried and stored at 45°F for 2.5 years have not shown a significant reduction in germination percentage. Or crack pits, extract seeds under dry conditions and store in a paper bag at 45°F.</p> <p>Take hardwood or semi-hardwood cuttings to propagate under mist for about two months. Transplant rooted cuttings to containers and grow until following May-June</p>	<p>Remove seeds from the pits in autumn. Soak seeds in water for 5 days. Discard water and replace with clean water every day during that period. This treatment will increase germination percentage of seeds.</p> <p>Stratify seeds in moist peat or perlite with Captan at 45°F for 40 to 60 days before planting.</p>	<p>Stratified seeds should be planted in the field or greenhouse in late January or early February. Stratified seed germinates in 4 to 5 weeks.</p>	<p>Fertilize and irrigate trees</p>	<p>T-bud Flordaguard rootstocks with desired scion cultivar. The bud should not contain xylem. Phony peach disease can be transmitted by chip budding budwood material that includes woody vascular (Xylem) tissue.</p>	<p>Plant May or June-budded trees (2 1/2 to 4 feet) high</p>