



Figure 2. The rich garden soil and the plants must be held down by adding a one to two inch layer of coarse gravel.

verted to a tiny gurgling fountain. After the plants are in, the fish are next. Try adding a *Betta*, a platy or two mosquito fish per 10 gallons.

Care

Water will evaporate from the pond and must be replaced. Simply adding water will not ensure the health of the pond. Roughly 25% of the water should be removed and replaced with fresh water on a weekly basis. The replacement water must be the same temperature and any chlorine must

be neutralized with chlorine-removing drops, available from pet shops. This is a necessity with municipal tap water. Aquatic plant fertilizer tablets should be added to the pots as needed. Generally, one tablet per gallon of soil is recommended.

Safety

Solar powered, low voltage pumps are very safe despite the initial expense. Gardeners choosing a water pump powered by household current must make certain their electrical outlet has a functioning ground fault circuit interrupt. This will shut down the flow of electricity should something go wrong. An electrician can easily replace a non-GFCI outlet with a new GFCI in minutes. Follow all instructions provided with the pump.

Small children should not be allowed near a miniature pond without close supervision. A safer pond for families with small children is one that closely resembles a bog. The entire pond container is filled with garden soil and is kept very damp. The emergent vegetation described previously should be selected for this type of environment rather than plants requiring open water.

Conclusion

Miniature ponds allow people to enjoy the beauty and peacefulness of traditional large ponds with minimal time and financial expenditure. The skills needed to build and maintain a miniature pond are easily learned and provide confidence for those who may later wish to build a larger pond. Miniature ponds can be planted with either dwarf lilies or emergent vegetation and stocked with fish. Optionally a child-safe bog can be created. The addition of a GFCI protected submersible pump provides water movement and pleasant gurgling sounds in the pond.

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CROSS-POLLINATION REQUIREMENT FOR 'GULFROSE' PLUM

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Abstract. 'Gulfrose', a new low chill Japanese-type plum (*Prunus salicina* Lindl.) from the University of Florida breeding program, was selfed and pollinated with 'Gulfbeauty' and 'Gulfblaze' at Gainesville, Florida. Visible pollen shed in the field for all 3 varieties. Pollen germination on 10% sucrose was 12% for 'Gulfrose', 9% for 'Gulfbeauty' and 28% for 'Gulfblaze'. Bagged shoots of 'Gulfrose' set and matured fruit when cross-pollinated by 'Gulfbeauty' and 'Gulfblaze', but set no fruit when self-pollinated.

Japanese plum breeding has been conducted at the University of Florida for 30 years and has resulted in numerous selections (Sherman and Lyrene, 1985; Sherman et al., 1992). 'Gulfbeauty' and 'Gulfblaze' (Sherman and Lyrene, 1998) were released in 1997 and 'Gulfrose' was released in 2000. Cross-pollination is generally required to ensure a good crop in Japanese plums as most varieties produce self-incompatible pollen. 'Gulfbeauty' (Fla. 85-1) and 'Gulfblaze' (Fla. 87-7)

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have been shown to be cross-fruitful in hand pollinated bagged flowering shoots (Richards et al., 1992), and they have produced good crops when planted together in a field trial at Gainesville. This work was undertaken to show that 'Gulfrose' produced abundant pollen and had good fruit set when cross-pollinated by 'Gulfbeauty' and 'Gulfblaze' as the latter 2 varieties flower together in spring and have consistently overlapped the first half of the bloom period for 'Gulfrose'.

Materials and Methods

Anthers of 'Gulfrose', 'Gulfbeauty' and 'Gulfblaze' were examined for pollen produced from dehiscent flowers in the field and anthers were harvested from ca. 100 unopened flowers for each variety in late February and dried in open plastic bags for pollen shedding. Pollen was frozen in sealed plastic bags until needed for germination and pollination. Pollen was gathered by rubbing a pencil eraser back and forth a few times in the plastic bag containing the dried anthers, brushed from the eraser onto three individual drops per variety of a 10% sucrose solution in a petrie dish, and germinated overnight at room temperature. Microscopic appearance for normal appearance and germination was observed the following day. Percentage germination was determined for each variety from 4 microscopic fields of ca. 100 grains each.

Twelve flowering shoots, about 20 to 25 cm long, were randomly chosen March 2, on 4 trees of 'Gulfrose' plum and open flowers were removed. On each of three shoots, five flowers were emasculated and hand pollinated with 'Gulfrose' (selfed), 'Gulfbeauty' and 'Gulfblaze' (pollen previously stored) and bagged and stapled around the bottom to eliminate outcrossing. Pistils from these three shoots were harvested the following day when they were sacrificed, fixed in FAA and prepared for fluorescent microscopy to determine pollen germination as done by Richards et al. (1992). The remaining nine shoots were each bagged and stapled around the bottom to prevent out-crossing. Three shoots were used to represent each pollen parent. The bags were removed daily, open flowers were hand pollinated with 'Gulfrose' (selfed), 'Gulfbeauty', and 'Gulfblaze', and the bags replaced. After 5 days all flowers had opened and had been pollinated (estimated 10 to 15 flowers each twig), thus remaining petals were removed to avoid attracting pollinating insects and bags were not replaced. Fruit set/shoot was determined on March 22 when fruit were ca. 1 cm diameter, but mature fruit were observed at ripening.

Results and Discussion

Japanese plums that bloom with the native species (*P. umbellata* Ell.) in mid- to late February at Gainesville are considered to be adapted. Earlier bloom is more susceptible to spring frost and later bloom does not set fruit well, probably due to high night temperature. The bloom period of native

Table 1. Pollen production in field and pollen germination of 'Gulfrose', 'Gulfbeauty' and 'Gulfblaze' plums, and fruit set in 'Gulfrose' after pollination by 'Gulfrose' (self pollinated), 'Gulfbeauty' and 'Gulfblaze'.

Pollen parent	Pollen production	Germination ^a (%)	Fruit set ^b (no.)
Gulfrose	Abundant	12.0	0.0
Gulfbeauty	Abundant	9.2	2.3
Gulfblaze	Abundant	28.5	1.0

^aAverage for 100 pollen grains in each of 4 microscopic fields.

^bAverage number of fruit set per shoot on 'Gulfrose' (avg. 3 shoots) when pollinated by each of 3 varieties.

plums lasts ca. 20 days from early to late February with each genotype lasting about 10 days. 'Gulfrose', 'Gulfbeauty' and 'Gulfblaze' plums have been released to date from the University of Florida breeding program. 'Gulfrose' plum blooms at Gainesville in late February (avg. 15 to 25 Feb.) and 'Gulfbeauty' and 'Gulfblaze' in mid-February (avg. 10 to 20 Feb.). Thus, 'Gulfrose' is overlapped in its first half of bloom by the second half of 'Gulfbeauty' and 'Gulfblaze'. This amount of overlap is adequate for full crops to set with minimum fruit thinning required in 'Gulfrose' as compared to 'Gulfbeauty' and 'Gulfblaze'.

All 3 plums visually produced abundant pollen from shedding anthers in freshly opened field flowers and from fresh anthers that were harvested and dried in the lab. Pollen germination on sucrose was in the range for previously reported genotypes (Richards et al., 1992). Pollen germination and tube growth in styles following hand pollinations of 'Gulfrose' flowers by 'Gulfbeauty' and 'Gulfblaze' pollen was confirmed by fluorescent microscopy.

Bagged shoots of 'Gulfrose' set and matured fruit when hand pollinated by 'Gulfbeauty' (2.3 fruit/shoot) and 'Gulfblaze' (1.0 fruit/shoot), but set no fruit when self-pollinated (Table 1). 'Gulfrose' trees have been observed to set a full crop when the first half of its blossoms overlapped with the last half of blossoms from other plum genotypes including 'Gulfbeauty' and 'Gulfblaze'. Based on this study and field observation, 'Gulfbeauty' and 'Gulfblaze' are recommended as cross-pollinizers for 'Gulfrose' plum.

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