tile drains separated from the soil by a semipermeable fabric. Pipe or holes shall be prevented from clogging up by wrapping or covering with a filter fabric.

References:

1. City of Raleigh Parks and Recreation Dept. 1991 ," Policies and Standards Governing Activities Which Impact City Trees"

Flood Tolerant Prunus

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Nature of Work: Many species of *Prunus* are notoriously intolerant of poor drainage. In some cases, inundation of the root system for only a few days can be sufficient to kill certain of these plants (1). Research conducted on commercial fruit trees, however, has shown there to be considerable variation in flood tolerance among different species and hybrids of *prunus (3).* For example, comparisons among cherry rootstocks have shown that *P. avium* is better adapted to poorly drained conditions than is *P. mahaleb* (2).

Conventionally, many of the flowering prunus are propagated by budding and grafting. Recently, however, there has been greater interest in growing flowering *Prunus* from rooted cuttings. Although this type of propagation can simplify production practices and minimize problems of rootstock suckering, there is little information on the adaptability ornamental *Prunus* trees when grown on their own roots.

The objective of this project was to evaluate differential sensitivity of ownrooted taxa of *Prunus* to acute flooding. Taxa studied included: *P. avium* 'F 12/1', *Prunus caroliniana, P. incisa x campanulata* 'Okame', *P. japonica, P. mume* 'Peggy Clark', *P. x* 'Newport', *P. sa*rgentii, *P. serru/ata* 'Kwanzan', *P. subhirtella* 'Autumnalis', *P. virginiana* 'Canada Red', and P. x *yedoensis.*

Own-rooted plants, 12-18" in height, were grown in *3* qt containers filled with
a media of 1 perlite: 1 pasteurized loam amended with .75 lbs. dolomite/yd^3. Plants were moved into a heated greenhouse on March 4, 1992. The experiment was a 11 (taxa) by 2 (flooded and control) factorial arranged in randomized complete block design with 7 - 10 replicate plants per factorial combination. Flooding was imposed in increments starting on May 4,1992.

Flooded plants were placed in individual 5 qt. buckets and enough water was added and maintain a water level that submerged the lower half of the root system. After two weeks, the water level was raised to submerge the lower three fourths of the plant's root systems. On May 25, 1992, three weeks after the flooding treatments were initiated, the water level was raised to completely submerged the root system of flooded plants. Flooding was relieved on June 22, 1992 following seven weeks of incremental flooding. Plants were maintained with irrigation as needed until June 30,1992 at which time all plants were stripped of their leaves, cut back to 18" in height, and were placed in a cooler at 43F for 12 weeks to simulate an overwintering period.

Results and Discussion: At the end of the treatment period, many flooded plants were severely defoliated, yet the stem tissue under the bark was often green. A cold dormant period was then provided so that survival could be more clearly distinguished when plants resumed growth. Survival was 100% for all control treated plants regardless of taxon (Table 1). Flooded plants, however, varied from 0 to 100% survival. *Prunus caroliniana* suffered the greatest with 0% survival while *P. serru/ata* 'Kwanzan', *P. mazzard,* and *P. x* 'Newport' had similar survival rates ranging from 90 to 100%. P. *mazzard* and P. x 'Newport' also had significantly lower defoliation as compared with the other taxa.

Significance to Industry: This research demonstrates that there is considerable variation in tolerance to poor drainage among taxa within the genus *Prunus.* Of the 11 taxa evaluated, *Prunus serrulata '* Kwanzan', *P. mazzard,* and *P. x* 'Newport' had the greatest tolerance to poor drainage as indicated by high survival rates and low defoliation following flooding. When selecting own-rooted taxa or rootstocks of *Prunus* taxa for poorly drained sites, more tolerant taxa should be selected (see Table *1). Prunus mazzard is* a compatible rootstock for many of the flowering cherries and should be considered as an understock for plants growing on poorly drained sites. *Prunus cerasifera,* one of the parents of 'Newport' has been shown to be a compatible rootstocks for some cultivars of *P. mume* and has the potential to considerably enhance the flood tolerance of *P. mume.*

Literature Cited:

1. Beckman, T.G.1988. Flooding tolerance of sour cherries. PhD Diss., Michigan State Univ., East Lansing.

2. Perry, R.L. Cherry rootstocks, p.217-264. In: R.C. Rom and R.F. Carlson (eds.). Rootstocks for fruit crops. Wiley and Sons, New York.

3. Rowe, R.N. and D.V. Beardsell.1973. Waterlogging of fruit trees. Hort.Abst. 43(9): 533-548.

Table 1. Survival and defoliation of 1 1 taxa of *Prunus* following seven weeks of treatment (incremental flooding and control).

Taxon	Survival (%)		Defoliation (%)	
	Control	Flooded	Control	Flooded
Prunus caroliniana	100a*	0 a	1 a	82 c
Prunus virginiana 'Canada Red'	100 a	43 b	1 a	100 cd
P. mume 'Peggy Clark'	100 a	50 bc	7 a	95 cd
Prunus japonica	100 a	50 bc	1 a	52 b
Prunus sargentii	100 a	60 bc	1 a	29 a
Prunus x *yedoensis*	100 a	60bc	0 a	87 cd
Prunus subhirtella 'Autumnalis'	100 a	70 cd	2 a	52 b
P. incisa x campanulata 'Okame'	100 a	70 cd	1 a	80
P. serrulata 'Kwanzan'	100 a	90 de	0 a	58 b
Prunus avium 'F 12/1'	100 a	100 e	1 a	27 a
Prunus x 'Newport'	100 a	100 e	5 a	15 a

* Means followed by the same letter within a column are not significantly different, $LSD_{0.05}$.