New York fruit growers with an interest in diversifying their crop mix by adding plum plantings face the issue of choosing rootstocks suited to their conditions. An important problem with plum rootstocks in some New York districts is plum brownline disease. About 25 years ago, research in California first connected plum brown line decline with the presence of the tomato ring spot virus in grafted plum trees. Infected trees can die from a hypersensitivity reaction at the graft union. The tree may come with the virus infection from the nursery or it can become infected after planting by a nematode vector, which moves the virus from a natural reservoir in orchard weeds. Orchard sites that have recently had peaches often are infected with the virus. Plum tree losses due to this disease have apparently been highest with European scions on either Myrobalan or peach stocks.

Current Plum Rootstocks

Myrobalan is the predominant plum rootstock offered throughout the nursery industry in the U.S. Dr. Jim Cummins reports that the European scions on the Myrobalan rootstock are well adapted to New York conditions. peach × Myrobalan cultivars have been used in the 10-year NC 140 plum rootstock trials. This trial included 14 stocks under the European plum scion, Stanley. The six most productive stock selections in Geneva were in descending order: Mariana 2624, Mariana 4001, Mariana GF 8-1, Myrobalan seedling, and St. Julien A. None of the six were statistically different in their cumulative yield. Neither were they statistically different in their cumulative yield efficiency. However, we did observe differences in their suckering. Three stocks out of the six listed above exhibited severe suckering in Geneva. In descending order these were: Mariana 2624, Mariana GF 8-1, and Mariana 4001. No stocks in this trial stood out for precocity and dwarfish growth. The Citation stock, which is somewhat dwarfish and has had considerable commercial success in California for plums and peaches, did not survive well in Geneva. Mariana 4001 and Mariana GF 8-1 were identified as the outstanding performers on a nationwide basis.

Most New York growers considering fresh market plum plantings would welcome a hardy plum rootstock with both dwarfing and high precocity. Our plum rootstock research at Geneva focuses on finding new stocks meeting these criteria.

Cornell-Geneva Plum Rootstock Trials

In 1989 the national plum rootstock testing group known as the NC 140 project organized a 10 year plum rootstock experiment. This trial included 14 stocks under the European plum scion, Stanley. The six most productive stock selections in Geneva were in descending order: Mariana 4001, Mariana GF 8-1, Myrobalan seedling, and St. Julien A. None of the six were statistically different in their cumulative yield. Neither were they statistically different in their cumulative yield efficiency. However, we did observe differences in their suckering. Three stocks out of the six listed above exhibited severe suckering in Geneva. In descending order these were: Mariana 2624, Mariana GF 8-1, and Mariana 4001. No stocks in this trial stood out for precocity and dwarfish growth. The Citation stock, which is somewhat dwarfish and has had considerable commercial success in California for plums and peaches, did not survive well in Geneva. Mariana 4001 and Mariana GF 8-1 were identified as the outstanding performers on a nationwide basis.

Most New York growers considering fresh market plum plantings would welcome a hardy plum rootstock with both dwarfing and high precocity. Torinel, and Jaspi are two new semi-dwarfing plum rootstocks that have good hardness and high precocity. There are several other new stocks that also are promising.

Having failed to identify any outstanding new plum stocks in the 1989 trial, we acquired a new set of candidates in which to look for excellent cold hardiness combined with dwarfing and high precocity. We have planted four young plum rootstock trials in Geneva which have just begun to yield useful data in the 2005 season. All four of the trials were planted in 2002. The first trial has the same seven rootstocks — in descending order of current trunk size: Cadaman, Penta, Ishitara, Mariana GF 8-1, Torinel, Jaspi, and Krymsk 1 (VVA-1). In 2005 the Jaspi stock under ‘Empress’ stood out for high yield efficiency and Ishitara was second highest. Jaspi is a tree with a significant degree of dwarfishness. Krymsk 1 has comparable dwarfish to Jaspi. However, in 2005, Krymsk 1 was much lower in yield than Jaspi. The average fruit size of Empress on Jaspi was only 46 grams, whereas those more vigorous stocks yielded fruit weights in the range 54-62 grams. These more vigorous stocks were more lightly set than Jaspi. It is likely that if the fruit loads had been more uniform across the stocks, the difference in fruit size would have disappeared.

A second experiment has the same seven rootstocks under the Asian diploid scion, ‘Oblinaja’. As in the Empress experiment, the stock which provided the
earliest ripening fruit was Krymsk 1 (=VVA-1). A third experiment has a Japanese diploid scion, NY 61J, on eight rootstocks. This rootstock group includes the same seven stocks as for Empress plus American plum. In these two trials with diploid scions, the three smaller stocks in both cases were Jaspi, Krymsk 1, and Torinel. Under the Oblinaaja scion, Krymsk 1 produced no suckers in 2005, whereas under the NY 61J scion, Krymsk 1 suckered quite heavily. This probably reflects much greater winter cold injury to the trunks of the NY 61J scion. The NY 61J scion on Torinel had less winter injury than on Krymsk 1 and also fewer suckers. Trees on Torinel were 60-75% smaller than on vigorous stocks, which is similar to the dwarfing level shown by Krymsk 1.

Our fourth plum rootstock experiment planted in 2002, contrasts the semi-dwarfing St. Julien stock, GF 655-2 to the full vigor Mariana GF 8-1, under three European plum scions. Contrary to our expectations, the GF 8-1 stock outperformed the GF 655-2 in both yield and yield efficiency.

Additional Rootstock Candidates for Future Consideration

California researchers plan to introduce a new Mariana stock, (M 40) in the near future. This stock is reported to be very similar to M 2624 but with many fewer suckers. This stock and other Mariana types have similar susceptibility to brown line decline of Mariana 2624.

Ted DeJong and others in California recently named two new dwarfing stocks, Controller 5 and Controller 9, which may have promise under plums since they are both peach by plum hybrids. We have Controller 5 in our peach rootstock trial in Geneva. It is dwarfing to about 50% of Lovell size and it has shown much better cold hardiness than Lovell (see peach rootstock article in the last issue). We do not know the cold hardiness of Controller 9. Hiawatha is another new stock to try under plums in the east. It was bred in South Dakota as a scion variety which tolerates the prairie states' winters. It has shown considerable promise in California as a rootstock that is intermediate in its dwarfing between Controller 5 and Controller 9.

References


