

PROJECT NO.: 5263 Progress/Termination Report

TITLE: High Density Cherry Culture

PERSONNEL:

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REPORTING PERIOD: 1985-95

ACCOMPLISHMENTS AND RESULTS:

1. Tree size control by dwarfing rootstocks or root restriction appears to lead to eventual weak growth and poor fruit size if left unmanaged. Invigoration of new shoot growth and a recovery of fruit size appear to be attainable with judicious fertilization and heavy pruning. Fruit size was also improved by fruit bud thinning, but not by post-anthesis fruit thinning. An orchard management plot with four different training systems was planted in 1994 as part of a separate project "High Density Sweet Cherry Orchard Management" under the direction of Prosser pomologist G.A. Lang.
2. Rudimentary calculations of yield efficiency (to estimate trees per acre) and precocity (to estimate return and amortization on initial investment) clearly demonstrate that high density orchards on certain dwarfing and/or precocious rootstocks are considerably more profitable than Mazzard, through the first six years of orchard establishment. Continuing analysis must be made for orchard longevity and long-term yields.
3. A wide range of variability in dwarfing and precocity was evident among rootstocks from Belgium (GM series) and Germany (GI series). For most, precocity (as measured by yield and yield efficiency) was significantly better than Mazzard; as Mazzard trees reached maturity, differences in yield efficiency diminished. Precocity was not necessarily related to size control, as some rootstocks (e.g., GI 148-1) exhibited as much vigor as Mazzard but earlier yields. Among the best rootstocks for both size control and yield efficiency were GI 148-2 and 148-8. The GI 148 series tended to promote a more spreading growth habit to 'Bing'. Analysis will continue as part of a separate project "Sweet Cherry Clonal Rootstocks - Performance and Physiological Evaluation" under the direction of Prosser pomologist G.A. Lang.
4. 'Bing' and 'Rainier' on Mazzard rootstock were successfully trained to a small Tatura trellis via three methods of root restriction. Inadvertent water stress may have further reduced vegetative vigor in some blocks. Cropping tonnages have been satisfactory, but fruit size has thus far generally been unsatisfactory. Two new management experiments have been imposed on the orchard as part of a separate project "High Density Sweet Cherry Orchard Management" under the direction of Prosser pomologist G.A. Lang.

5. Other cultivars planted on dwarfing rootstocks have just begun to carry measurable crops. The Prosser 'Bing' clone collection is beginning to yield several selections with interesting fruiting or growth habit characteristics. A second generation orchard of these clones has been established. Some vigor control may be associated with "horticulturally beneficial" prune dwarf (PDV) or Prunus necrotic ringspot (PNRSV) viruses, since virus-free clones are the largest trees in the block. A clone that tested positive for both PDV and PNRSV is comparable to the clonal rootstock GI 148-8 in terms of tree and fruit size, with a high yield efficiency. 'Bing' mutants from the OSU radiation experiment have not yet yielded any selections of obvious horticultural interest.