

PROJECT NO.: 6719 TERMINATION REPORT

TITLE: Rapid Detection of Fruit-Deforming Viruses of Apples

YR INITIATED: 1990 **CURRENT YR:** 1993 **TERMINATION YR:** 1993

PERSONNEL:

Project Leader: G.I. Mink, Plant Pathologist, WSU-Prosser

Cooperators: W.E. Howell, Oper. Manager, IR-2/NRSP-5, WSU-Prosser
Guang-Yu Zheng, Visiting Scientist, China

PROGRESS:

Containerized fruiting trees of Red and Golden Delicious inoculated in 1989 with a collection of fruit-marking viruses and viroids expressed strong fruit symptoms in 1990 and 1991. Trees inoculated with different apple green crinkle disease sources expressed no fruit symptoms in 1992. In contrast, trees infected with apple scar skin and dapple apple viroids expressed much stronger symptoms in 1992 than in either 1991 or 1990. The environmental conditions that contributed to these symptom variations are unknown. These results emphasize the need for greenhouse and laboratory techniques to replace or supplement field testing.

Attempts to develop electronmicroscope techniques to rapidly detect and identify apple viruses were terminated when the EM stopped functioning. No funds are available to replace the instrument.

Two types of rapid detection methods were developed to detect the viroids causing apple scar skin and dapple apple diseases: 1) Dormant budwood can now be indexed on either of two viroid-sensitive indicator cultivars (Starks Earliest and Sugar Crab) by double bud inoculation. Inoculated plants held at 18°C under constant light express pronounced epinasty within four to seven weeks; 2) Methods were developed to use complimentary RNA hybridization probe produced at Beltsville, MD, for rapid detection of these viroids in fresh or dried leaf tissue, as well as in fruit, seed, and bark. These techniques have reduced the indexing time for apple viroids from two years to less than two months or approximately two days, depending upon the method used.

These methods were used in 1992 to accelerate introduction of foreign apple cultivars into and through the heat therapy program.

BUDGET:	<u>1992/93</u>
00 - Salaries (.50 lab assist.)	\$12,000
03 - Goods and services	2,500
04 - Travel	1,000
07 - Fringe benefits	<u>3,200</u>
TOTAL	\$18,700