Project Number: 9594 (Termination Report)

Title: Evaluation of Selected Apple Cultivars for the Northwest

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Accomplishments: This project should be viewed as similar to a breeding program. It allows selection of the most promising materials from dozens of breeders, however, and it increases the chances of finding a successful selection to perhaps 1 in 10, rather than the less than 1 in 1,000 achieved from a standard breeding program. Furthermore, in contrast to the 5- 7-year wait from initial cross to first fruiting in a standard breeding program, it has taken us just 8 years to achieve our objective of obtaining and evaluating new apple cultivars and selections from worldwide sources, and then providing unbiased data on their potential for the Washington apple industry. The need for variety testing is unending; the program gains value each year, and the interest on our investment already is beginning to pay off.

We established one of the premier cultivar testing programs in the U.S.; it is being duplicated in many areas. We were asked to prepare the list of initial cultivars and to find scionwood sources for a nationwide program similar to the NC 140 rootstock study. Our role as the single unbiased source of information in Washington on climate-specific performance of new cultivars and strains has resulted in my answering hundreds of calls for such information from growers in Washington and other states.

This project has brought attention to the Washington fruit industry through articles in The Wall Street Journal, The New York Times, Tokyo newspapers, the Seattle Times, Bon Appetit, Sunset, and many other publications. Because our project has become a significant worldwide source and repository of the newest cultivar developments, I have been invited, at little or no expense to the project, to give talks in South Africa, Western Europe, Japan, New Zealand, Canada, and in at least 6 states. This has given impressive visibility to WSU and to the TFRC and has opened doors to our obtaining some of the most advanced selections and cultivars available.

Examples of the kind of impact this program can have on industry development: 1) My earlier introduction of the Jonagold variety into western Washington experimental plots while it was still under a New York selection

number. Jonagold now is the primary cultivar in a growing western Washington industry, and the variety continues to expand in central Washington. 2) By providing factual information about the Senshu cultivar, I recently was able to help prevent individuals/nurseries (perhaps unintentionally) from misrepresenting the cultivar as an early ripening Fuji sport. Our program can serve the same functions in the future.

Results: Descriptive and harvest data were first reported in 1990, from trees planted at Prosser, Wenatchee, and Mt. Vernon in 1988. In 1991, we published comprehensive reports of harvest data and profiles of 75 cultivars. Also in 1991, we initiated crosses which produced over 4,000 seeds (approved by our WSU/grower steering committee). ARC Director Zuiches did not approve planting of the seeds. In 1992, we were granted exclusive permission by the Japanese government to test virus-free Sansa and Shinsekai in the U.S. The steering committee also approved moving to a new site in the Wenatchee area, but the Commission did not approve. In 1993 the project was limited to work at Prosser only. The plot currently holds 62 advanced selections and 55 cultivars and strains. (We have evaluated almost 150 acquisitions.) It contains the most advanced apple genetic material in the U.S., and some cultivars and strains available nowhere else in this country.

As a result of this project, the following cultivars and selections appear to be worthy of commercial trial in Washington: **Arlet, Empire, Florina, Fu Shaui, NJ 107, 109, 116, Orin, Senshu, Shizuka, Tsugaru** red strain, and **Yoko.** Equally important, we found that the following appear to have only limited potential: **Coromandel Red, Drakenstein, Dulcet, Elstar, Fiesta, Gloster, Himekami, Keepsake, Michinoku, Nebuta, NJ 55, 56, 90, 99, 100, 103, 104, 105, Sayaka, Scarlet, Shamrock** (partial list). As a result of our investigations and contacts, we have noted a great many new selections and cultivars which should now be acquired for evaluation.

Recommendations: The merits of this project are only beginning to be appreciated; it would be unwise to discontinue this effort. Please consider the following: 1) Develop an integrated variety testing program, with various phases--from highly protected trials of proprietary materials to advanced testing at grower sites; 2) initiate a new test site in the Wenatchee area with a reduced number of cultivars, more replication, to produce fruit for post-harvest studies; 3) reimport the best Fuji strains from a documented source in Japan (Many of the present strains being propagated by nurseries are not true to type.); 4) continue to establish relationships with foreign and domestic breeders to allow "safe" unbiased testing of new germplasm; and 5) continue primary emphasis of the program at Prosser, where germplasm can be best evaluated for resistance to heat stress, where there is close cooperation with the IR-2 program, and where land and good management are available.

Publications:

Norton, R. A. Promising apple cultivars and selections for the Pacific Northwest and British Columbia. Proc. B.C. Growers Forum, Penticton, B.C. (in press).

Norton, R. A. 1993. Bagging Fuji apples: the grand experiment, The Good Fruit Grower, November 15.

Norton, R. A. 1993. Don't give up on Braeburn, The Good Fruit Grower, March 15, p.43.

Norton, R. A. 1993. The potential impact of new varieties on the global apple industry. George Goodling memorial lecture. Proc. 134 Annual Meeting, Pennsylvania Fruit News, 73:(4) 20-25.

Norton, R. A. 1993. Effects of second and third generation apple varieties on the Northwest industry: potentials and problems. Proc. 134 Annual Meeting, Pennsylvania Fruit News, 73:(4) 37-41.

Norton, R. A. 1992. Apple and pear varieties for the nineties. Proc. Cape Pomological Association, Republic of South Africa.

Norton, R. A. 1992. Production trends of pome and stone fruits in North America and Australasia. Proc. Cape Pomological Association, Republic of South Africa.

Way, R. D., R. A. Norton and J. N. Cummins. 1991. Register of New Fruit and Nut Varieties. List 35. J. N. Cummins ed.. HortScience 26 (8) 952-960.

Stebbins, R. L. and R. A. Norton. 1991. Current situation and future trends in apple cultivars in the Pacific Northwest. Fruit Varieties Journal 45 (2):79-83.

Norton, R. A. 1991. Playing the strain game, The Good Fruit Grower, October 15, pp. 3, 37-39.

Norton, R. A. 1991. Apple cultivars: current situation and future trends in Japan. Fruit Var. J. 45:(2):84-86.

Norton, R. A. and H. DeCoster. 1991. Current situation and future trends in apple cultivars in western Europe. Fruit Var. J. 45 (2):87-89.

Norton, R. A. 1990. New apple varieties: where do they fit? Proc. N.Y. State Hort. Soc. 135:47-56.

Norton, R. A. 1990. Cultural tips for the promising new apple varieties. Proc. N.Y. State Hort. Soc. 135:57-62.

Norton, R. A. 1990. What you need to know about growing Elstar, Gala, Jonagold, Fuji, and Braeburn. Proc. Washington State Hort. Assoc. 85:92-93.

Norton, R. A., G. A. Moulton and J. King. 1990. Varieties for western Washington: apple variety descriptions. Washington State Nursery and Landscape Assoc., Balls & Burlap, 42(2):4, 11.

Norton, R. A. 1989. Exploring new varieties of apple--Japan. Compact Fruit Tree--International Dwarf Fruit Tree Assoc. 22:57-58.

Norton, R. A., R. L. Stebbins, W. David Lane and J. A. Ballard. 1989. the strains of Gala, Fuji, and Jonagold described. The Good Fruit Grower, April, pp. 7, 40-42.

Norton, R. A. 1989. Apple varieties, now and in the future. Western Colorado Hort. Soc. Proc. 46:57-61.

Norton, R. A. 1989. Tree fruit variety research in Washington. Western Colorado Hort. Soc. Proc. 46:44-46.

Norton, R. A., and J. King. 1987. Apple cultivars for Puget Sound. WSU Ext. Bull. 1436, 70 pp.

Norton, R. A. 1987. Current status of several Japanese apple cultivars. Fruit Var. J. 41(1):22-28.

Norton, R. A. 1987. Promising apple and pear varieties from Japan. Pomona (NAFEX) 20(1)34-38.

Reports:

Norton, R. A., G. A. Moulton, J. King and D. Ophardt. 1992. WSU-Tree Fruit Research Commission Apple Cultivar Trial, 24 pp, $5.

Norton, R. A., G. A. Moulton, J. King and D. Ophardt. 1991. WSU-Tree Fruit Research Commission Apple Cultivar Trial, Eastside and Westside editions, 70 pp., $10 each.

Norton, R. A., G. A. Moulton and J. King. 1990. WSU-Tree Fruit Research Commission Apple Cultivar Trial, 51 pp., $7.50.