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Introduction to the Workshop—Scab-Resistant Apple Cultivars: An Update on Horticulture, Pests and Markets

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Apple researchers and apple growers have shown increasing interest in determining the horticultural, pest management. and marketing attributes of scab-resistant apple cultivars (SRCs) in recent years, but have found relatively few mature plantings available for study. A number of plantings have been established recently in the eastern USA, with several on-farm and on-station studies using recently released cultivars and advanced selections.

The Northeast Sustainable Apple Production Project sponsored this workshop as part of an ongoing effort to facilitate dissemination of information gathered from both mature and recent plantings. The Project members (Cornell University, Rodale Institute, Rutgers University, University of Massachusetts and University of Vermont) appreciate the support received from the USDA Sustainable Agriculture Research and Education (SARE) Program, Northeast Region; and the EPA Agriculture in Concert with the Environment (ACE) Program.

An interactive workshop format was chosen to encourage presentation and discussion across disciplines (plant pathology, entomology, horticulture, genetics, post harvest physiology, marketing) as well as across growing regions. The goal was to include as much of the latest information, including preliminary data, that is pertinent to SRCs. On January 24-25, 1993, 42 researchers and extension specialists joined 17 growers and industry representatives in Hershey, Pennsylvania. The workshop contained 18 oral and four poster presentations. The papers that follow are written either as abstacts or as 'mini-papers'; please feel free to contact the authors directly for further information. In addition to allowing time for discussion following each presentation, four hour-long discussion sessions were interspersed throughout the program to encourage further exploration of several topics. The complete program follows this introductory article.

Several salient points from these sessions deserve reporting here.

'Scab-Resistant' Versus 'Disease-Resistant' Nomenclature

One significant outcome was the unanimous vote of workshop participants to promote use of the more conservative, and accurate, term 'scab-resistant apple cultivar' (SRC) instead of the more commonly used, and ambiguous, term 'disease-resistant apple cultivar' (DRC). While it was noted that 'scab resistance' is the attribute common to all the cultivars commonly referred to as DRCs, these cultivars vary in the number of diseases to which they are resistant.

In support of this mandate the workshop proceeding are being published using the phrase 'Scab-resistant Apple Cultivars' versus the original designation 'Disease-resistant Apple Cultivars.'

Stability of Currently Available Resistance Genes

The observation of apple scab on one fruit of the scab-resistant advanced selection NY 74828-12 in Vermont in 1992 prompted a discussion of the stability of currently available scab-

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resistance genes. In order to provide an accurate status report on this matter the workshop organizers invited Susan Brown of New York and Lorraine Berkett of Vermont to submit a manuscript to place the field observation in context. This invited manuscript is the first one to appear in the published proceedings that follow.

Need for Descriptors for Cultivars with Multiple Resistance

The participants agreed that some system for designating the various diseases and strains to which some cultivars are resistant would be useful to researchers and particularly valuable to growers as they look through nursery catalogs. A system similar to that used for tomatoes was considered appropriate and forming an *ad hoc* committee of breeders and plant pathologists was discussed, but no formal action was taken. Anyone wishing to coordinate such an effort is encouraged to contact either of the authors.

Conclusion

The workshop organizers hope that the abstracts and mini-papers that follow are helpful to those of you interested in scab-resistant apple cultivars. The workshop participants all seemed to appreciate the ample time allowed for discourse and we encourage other organizers to schedule more discussion time into their workshops and conferences. The participants suggested that we reconvene in three years. We hope to see you in 1996.

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An Explanation for Reports of Apple Scab Infection on Fruit of NY 74828-12

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The occurrence of scab in Vermont on one fruit from the scab resistant advanced selection NY 74828-12 was noted at harvest in 1992. In 1993 both fruit and foliar symptoms have been observed on this selection in Pennsylvania with scab-like symptoms on the foliage in Vermont. While these reports have raised concerns about the breakdown of the V_f gene for resistance to apple scab, there have been no reports of any infection of advanced selections or cultivars with the V_f gene for resistance. Although there are several genetic sources of resistance to scab, V_f is the predominant source used by most breeding programs. Examination of the breeding record of NY 74828-12 reveals that its source of resistance to scab is *M. atrosanguinea* 804. This source of resistance can confer either the V_f gene or the V_m for resistance. NY 74828-12 has the V_m gene for resistance as evidenced by the occurrence of transient pit type lesions from controlled inoculations of scab. The V_m gene is susceptible to race 5 of apple scab, unlike V_f, which is resistant to race 5. The development of scab in Vermont, and the report of scab symptoms on NY 74828-12 in the Rodale Institute Research Center orchards in Pennsylvania this year indicates that race 5 exists within these areas. The infection observed on NY 74828-12 will help us to assess the prevalence of race 5 within our growing regions and to gauge the rate and extent of disease development. Researchers and growers testing NY 74828-12 are encouraged to contact the authors if scab infections are noted in their test plots.

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