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The West Virginia University Ecosystem Project for Processing Apples: Comparisons Among 'Liberty,' 'Golden Delicious,' 'York' and 'Fuji' in the First Year of Growth

ALAN R. BIGGS,[1]* JAMES B. KOTCON,[2] TARA A. BAUGHER,[1] ALAN R. COLLINS,[2] D. MICHAEL GLENN,[3] HENRY W. HOGMIRE,[1] ROSS E. BYERS,[4] ALAN J. SEXSTONE,[2] AND GARY W. LIGHTNER[4]

The West Virginia University Ecosystem Project for Processing Apples was initiated in 1989 on a 14-acre site at the University Experiment Farm in Kearneysville, WV. In spring, 1990, the site was divided into six 2-acre main plots with each plot randomly assigned one of two treatments, e.g., conventional or ecosystem-based production practices. A Kentucky-31 (K-31) tall fescue sod was established in the ecosystem plots in May, 1990. The sod was maintained for two growing seasons in order to increase soil organic matter and to favor development of nematode-suppressive soils. Conventional plots were disked and planted to corn in May, 1990 and 1991, and received fertilizer, nematicide and herbicide treatments. In March, 1992, before planting the trees, the sod was killed in the tree rows of ecosystem plots with the herbicide glyphosate. In the conventional plots, alleys were planted with K-31 and a strip 8 feet wide under the trees was treated with herbicide. Each main plot was divided into four subplots which were planted in March, 1992, with one of four apple cultivars: 'Yorking,' 'Smoothee Golden Delicious,' 'Liberty' (resistant to apple scab), or 'Red Fuji #2' on M.26 EMLA rootstock. Trees were established at 8.0 x 18.0 feet with every tenth tree a pollinizing cultivar. The experiment is arranged as a randomized block, split plot design with management systems as whole plot treatments and apple cultivars as subplot treatments. Incidence of foliar diseases, European red mite (ERM), and rose leafhopper (RL), as well as first season's tree growth and leaf nitrogen were determined in 1992. Differences due to management systems included higher leaf N and a lower level of apple scab in the ecosystem plots. For cultivars, in addition to resistance to scab, 'Liberty' also showed resistance to powdery mildew, cedar-apple rust, and frogeye leafspot. RL was similar across cultivars. All cultivars showed similar increases in trunk diameter; 'Liberty' and 'Golden Delicious' were taller at terminal bud set than 'York' and 'Fuji,' and tree spread and numbers of laterals were least for 'Liberty.'

[1]West Virginia University, University Experiment Farm, P.O. Box 609, Kearneysville, WV 25430.
[2]West Virginia University, College of Agriculture and Forestry, Morgantown, WV 26506.
[3]U.S.D.A.-A.R.S., Appalachian Fruit Research Station, Kearneysville, WV 25430.
[4]Virginia Polytechnic Institute and State University, Winchester, VA 22601.