

VISION 2000

A blueprint for the future of the Northwest Michigan fruit industry created by the Northwest Michigan Horticultural Research Foundation

Introduction

The Northwest Michigan Horticultural Research Station is uniquely situated on the sandy hills of northwest Michigan, surrounded by abundant fresh water, in the center of an important fruit producing and tourist region. Michigan produces approximately 75% of the tart cherries grown in the United States, with half of Michigan's production coming from the five county northwest Michigan area. Michigan is also a major producer of sweet cherries with 90% of the state's production coming from northwest Michigan. Apples represent a third important fruit crop for northwest Michigan with production rapidly increasing. Several other important fruit crops, including plums, peaches, apricots, pears, wine grapes and strawberries are also grown in the area.

In the late 1970's, the fruit industry in northwest Michigan founded the Northwest Michigan Horticultural Research Foundation and financed the formation of the NWMHRS. Since that time, operation of the station has been under the direction of Michigan State University's Agricultural Experiment Station. A unique partnership has evolved that today includes the Foundation and MSU AES working with MSU Extension, Michigan Department of Agriculture, USDA, fruit commodity groups and others in the private sector.

"Vision 2000"

The goal of the Northwest Michigan Horticultural Research Station is to maintain and enhance the economic competitiveness of the Michigan fruit industry within the changing global market, while utilizing production systems that produce high quality safe foods and assure long-term biological and economic sustainability.

The "playing field" within which the fruit industry functions today in the U.S. is rapidly changing. Markets are becoming much more global, forcing our industry to compete with production from around the world. At the same time, concerns in this country with environmental and human health issues are rapidly changing the agricultural landscape. New regulations in the past decade have added significantly to the cost of agricultural labor and pesticide use. Furthermore, many of the older pesticides used by fruit growers have been lost due to the cost of reregistration, while pesticide residue concerns are placing new market demands on fruit producers.

Growers realize it is in their best long term interest to produce quality crops in an environmentally sound manner. NWMHRS's unique geographical location and committed on-site and campus faculty make it ideally situated to become a focal point for addressing environmental and food safety issues and concerns.

Action Plans:

1. Develop a Center for Integrated Fruit Systems Management

"Integrated Fruit Systems Management" (IFSM) is a concept that utilizes all available knowledge to produce fruit in economically and biologically sustainable methods. It recognizes the interrelationship that each management decision or practice has on various aspects of the total economic and biological system. The key components of IFSM are:

A. Integrated Pest Management (IPM)

IPM offers a proactive method to manage pests, including diseases, insects, weeds, nematodes, deer, rodents, birds, etc., with reduced pesticide usage while maintaining necessary quality and yield. It addresses issues related to pesticide residue reduction, environmental concerns, methods to delay development of pest resistance to pesticides, helps growers cope with loss of pesticides, and much more. IPM utilizes all available information and

knowledge of pests, biological control, host susceptibility, damage thresholds and pesticide and non-pesticide management alternatives and impacts. The level of pesticide reduction is limited mainly by the current level of knowledge of factors that impact the pest complex, availability of quality real-time information during the growing season, pesticide application technology and market demands. Therefore, to enhance IPM implementation requires a combination of research and education.

1) **IPM Research** - Focus research on understanding biotic and abiotic factors that influence pest development; economic damage thresholds; monitoring systems; biological control; abiotic control; pesticide evaluation for pest control and impact on biological control organisms; mating disruption; pest resistance monitoring; spray application technology; and improving predictive models.

2) **Expand Microclimate Data Collection and Dissemination** - Develop a sophisticated system for collecting microclimate environmental data from throughout northwest Michigan's fruit growing region. This data will be disseminated to growers to provide vital real-time information critical to achieving advanced IPM implementation for disease, insect and mite management.

3) **Disseminate Knowledge and Real-Time Information to Growers** - MSU's Fruit IPM Coordinator, officed at the NWMHRS, will provide leadership for advanced statewide IPM training to growers and professional IPM practitioners; provide regional real-time information to growers using a combination of delivery systems; and provide information on the safe handling and use of pesticides.

B. Nutrient and Soil Management for Sustainable Fruit Production in Sandy Soils

Sustainable agricultural production must be based on sound soil management that provides profitable production but does not contribute to excess nutrient loading of ground or surface waters. To achieve this objective, research and information will focus on:

1) **Fertigation** - Current research at NWMHRS indicates a 50% reduction in nitrogen is possible when applied via trickle irrigation. Work needs to expand on this finding -- analyzing other nutrients applied via irrigation and refine nitrogen rates.

2) **Nutrient Leaching** - Assessing impact of nutrient leaching below the root zone from various nutrient management systems under conditions of sandy soil and over 100" of annual snowfall.

3) **Non-conventional Alternatives** - Evaluate foliar feeding and other non-conventional alternatives and integrate into nutrient management practices as appropriate. Evaluate the potential for grinding and composting orchard prunings. Work with municipalities for alternatives for the disposal of leaf litter, sludge, etc.

C. Orchard Floor Management

Management systems for the ground cover on the orchard floor will influence moisture retention, nutrient competition, soil erosion, organic matter, pest and predator habitat, herbicide use and much more.

1) **Competitiveness of Ground Cover** - Evaluate influence on production of various management systems under sandy soil conditions with and without irrigation.

2) **Influence of Biological Diversity on Pest and Predator Populations** - Evaluate the role of various orchard floor management systems on the levels and types of biological diversity.

3) **Influence of Mulching Systems** - Evaluate mulching materials and techniques to reduce need for herbicides and irrigation.

4) **Herbicides and Non-herbicide Weed Control** - Evaluate and demonstrate various herbicide programs and non-herbicide alternatives such as alleopathic plants.

D. Tree Training Systems

New tree training systems will be developed and evaluated that enhance early production; increase efficiencies of inputs, including pesticides, fertilizer, labor, fuel, etc.; and adapt better to available dwarfing rootstocks and new cultivars.

E. Orchard Management and Post-Harvest Handling Technology Development and Evaluation

Orchard management, harvesting, handling and processing technologies will continue to be developed and evaluated to determine their efficacy and affordability. These technology evaluations will include, but not be limited to:

1) **Pesticide Application Equipment** - Both the evaluation of emerging technology, such as the air curtain sprayer, and the improved management of existing technology are areas that offer tremendous opportunities to achieve reductions in pesticide use.

2) **Plant Growth Regulators** - Improve the efficacy and efficiency of plant growth regulator use, with emphasis in cherry and apple production systems.

3) **Improve Technologies for Orchard Management** - Evaluate and develop methods to improve production efficiency and fruit quality.

4) **Improve Technologies for Harvesting, Handling, Packing and Processing** - This is essential to deliver high quality product into a global market.

5) **Information Dissemination Technology** - The NWMHRS will continue to develop new and innovative systems for delivering real-time information to clientele.

F. Integrated Fruit Systems Management Demonstration

Develop a demonstration that integrates the above components of IFSM that would serve as an example of cutting edge sustainable practices. Demonstration will be developed by a consortium of leading IFSM practitioners, MSU research and Extension personnel, SCS, SCD, and other appropriate resource people.

2. Variety and Rootstock Evaluations

The evaluations of fruit varieties and rootstocks from throughout the world is essential to keeping the fruit industry competitive. Variety evaluations will focus on sweet and tart cherries, plums and apples, with smaller plantings of apricots and peaches. New plantings of grapes and strawberries are anticipated. Rootstock evaluations will be primarily conducted with tart cherries, sweet cherries and plums.

3. Information Dissemination

Information dissemination is critical to the fulfillment of the NWMHRS's Extension commitment. This high priority objective will target the following groups:

A. **Fruit Industry** - From production to marketing to economics, the staff at the NWMHRS will continue to provide timely, pertinent information to fruit growers, Extension agents, agribusiness personnel and others associated with the fruit industry.

B. **Public** - Public understanding of fruit production systems and research activities at the NWMHRS are increasingly important priorities. The focus to reach the public is to utilize mass

media, particularly TV, radio and nonagricultural newsprint and to provide tours for nonagricultural groups of the IFSM demonstration and research projects to improve the understanding of agricultural systems.

C. **Youth** - A significant new initiative is being developed to expand educational programs at the NWMHRS for K-12 youth.

4. Partnering

The NWMHRS will encourage and foster increased cooperation and partnering with other organizations and groups. Increased partnering will involve both traditional and non-traditional groups in all phases of our activities, from program development to information dissemination. A focus group will be developed that includes growers, MSU and USDA personnel, community leaders and environmentalists. This group will assist the NWMHRS in the development of the programs and systems that provide the necessary information to assure that fruit production remains a vital part of Michigan's future.

The Northwest Michigan Horticultural Research Center, where the public and private sectors meet to help agriculture, consumers and the environment!