

NEW HORIZONS

NORTHWEST MICHIGAN HORTICULTURAL RESEARCH STATION STRATEGIC PLAN - 2002

Mission Statement

NWMHRS works to create and expand knowledge through cutting-edge research on cherries and other fruits and to disseminate state of the art information to the Michigan fruit industry and the public.

Introduction

The Northwest Michigan Horticultural Research Station (NWMHRS) is uniquely situated on the sandy hills of northwest lower 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 48% of the U.S. production coming from the five-county northwest Michigan area. Michigan is also a major producer of sweet cherries with over 85% of the state's production coming from northwest Michigan. Apples represent a third important fruit crop for northwest Michigan. Several other important fruit crops, including wine grapes, plums, peaches, apricots, pears, strawberries and raspberries 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 then, operation of the station has been under the direction of Michigan State University's Michigan Agricultural Experiment Station (MAES). A unique partnership has evolved that today includes the Foundation and MAES working with MSU Extension, Michigan Department of Agriculture, USDA, fruit commodity groups and others in the private sector.

BACKGROUND

In 1993 the NW Michigan Horticultural Research Foundation undertook a long-range planning process, Vision 2000, to set goals and directions for the NW Michigan Horticultural Research Station. Now, at the beginning of a new century and a new millennium, 8 years of development have established successful projects and research outcomes. The Foundation Board engaged in a strategic planning process during 2001. They invited representatives from local and state horticultural organizations, along with MSU researchers, extension agents and administrators, to target the emerging issues of the fruit industry.

The resulting plan focuses on four critical program areas: 1) integrated pest management, 2) horticultural production and handling, 3) value added processing, marketing, and fruit farm financial management, and 4) public education. With a focus on these areas, the Station seeks to align its present and future activities with industry needs and public demands.

I. INTEGRATED PEST MANAGEMENT

Goal: The NWMHRS will be one of the premier sites in the U.S. for integrated pest management (IPM) research and information dissemination for the fruit industry.

Objective 1: Continue to improve the quality, convenience and timeliness of real-time information that will enhance IPM implementation.

Action:

- Increase the amount of information that is available through the code-a-phone system.
- Evaluate future technological advances in communication devices and systems to improve the information delivery to the growers.
- Encourage the further use of email for IPM information dissemination and enhance IPM information on the NWMHRS web page.
- Expand the weather data collection network in NW Michigan.
- Evaluate and enhance the use of predictive models in IPM.

Evaluation:

NWMHRS staff will assess the quality, convenience and timeliness of IPM research information by conducting informal, one-on-one, annual interviews with local consultants, members of local horticultural organizations and the IFS Think Tank.

Objective 2: Continue pesticide evaluations, emphasizing those for cherries and other tree and small fruits important to NW Michigan.

Action:

- Conduct evaluations of pesticides that show potential to benefit the fruit industry.
- Establish and maintain orchards and vineyards for the testing of insecticides, fungicides and herbicides.
- Improve the necessary equipment for both on and off site research trials.
- Conduct IR-4 trials that are critical to the labeling of pesticides important to Michigan fruit crop production.
- Evaluate pesticides for phytotoxicity.
- Conduct economic evaluations of alternative pest management strategies.
- Evaluate pesticides that qualify for use in organic production systems for efficacy, phytotoxicity, and impact on beneficials.

Evaluation:

Each year the Station staff will review the funding support of these projects.

Objective 3: Improve the efficiency of pesticide application and use to minimize environmental and food safety concerns.

Action:

- Evaluate emerging pesticide application technologies that offer opportunities to achieve reduced pesticide use and/or drift.
- Work with industry to ascertain and minimize actual pesticide residues.
- Study fate of pesticides in orchard production systems to eliminate potential environmental concerns.

Evaluation:

MSU agricultural engineers and others involved in pesticide use will assess progress.

Objective 4: Develop non-pesticide based IPM strategies to manage important insect and disease pests in Michigan orchards and vineyards, including (but not limited to) Armillaria root rot, nematodes, cherry leaf spot, cherry fruit fly and plum curculio. Also, evaluate organic approaches to pest management.

Action:

- Evaluate a wide range of *Prunus* material to find improved resistance to Armillaria, and then incorporate resistance into cherry rootstocks.
- Search for biological antagonists and/or bio-control organisms for Armillaria.
- Study the soil's biological food web in orchard/vineyard systems and ascertain impacts on plant parasitic nematodes, pathogenic fungi and insect pests.
- Evaluate tart cherry cultivars, including MSU breeding program selections, for resistance to cherry leaf spot and European brown rot.
- Evaluate disease resistant apple and pear cultivars and rootstocks under NW Michigan conditions.
- Develop and evaluate improved monitoring techniques for selected fruit pests, with particular emphasis on plum curculio.
- Develop and/or evaluate non-conventional insect management strategies, such as bait and kill and trap-out, for selected pests such as plum curculio and cherry fruit fly.
- Evaluate mating disruption strategies for managing selected orchard and vineyard pests.
- Establish systems trials to research the effects of new innovations in orchard systems for pest management.
- Improve biological control strategies in orchards and vineyards.

Evaluation:

Feedback from grower groups, MSU teams, Parallel 45 Vines & Wines, IFS Think Tank. Project teams will submit reports to funding sources annually. They will make presentations to organizations such as the Michigan Cherry Committee and reports at annual horticultural society meetings.

Objective 5: Explore the influence of groundcover management on the pest and beneficial arthropod populations in fruit crops.

Action:

- Conduct trials to explore the role of ground cover management in two-spotted mite population dynamics.
- Establish additional on-farm demonstrations of various ground covers and demonstrate their effect on phytoseiid (predatory) and phytophagous mite populations.
- Conduct trials on various weed control timings to discern any influence on mite populations.
- Evaluate the role of orchard floor plant diversity on pest and predator populations.

Evaluation:

Consult with IFS Think Tank to determine if additional work is desired in this area of research/extension.

II. HORTICULTURAL PRODUCTION AND HANDLING

Goal: By conducting state-of-the-art research and disseminating knowledge, the NWMHRS will continue to be a national leader in addressing issues in fruit production and handling to meet emerging market trends.

Objective 1: Study the roles of soil and nutrient management and ground covers to achieve a sustainable and cost-effective system that produces desired quality and yield while minimizing nutrient leaching.

Actions:

- Further investigate the role of soil microbes in carbon-nitrogen cycling in orchard systems.
- Analyze the impact of orchard floor management alternatives on soil microorganisms in an orchard ecosystem.

- Continue to assess alternative management practices and ground covers to control nitrate leaching.
- Evaluate and demonstrate various herbicide programs and non-herbicide alternatives such as alleopathic plants and mulch.
- Evaluate the influence of the ground cover on tree productivity and growth.
- Conduct studies on fertigation to reduce nitrogen application rates and minimize nitrate leaching.
- Conduct research to analyze the potential for precision application of nutrients and lime in orchards.
- Conduct research on compost production and application in orchard and vineyard situations.
- Initiate research to evaluate foliar feeding and other non-conventional nutrient management alternatives.

Evaluation:

Feedback from Integrated Fruit Systems Think Tank, publication in scientific journals, articles for growers, programs for growers and consultants, annual reports to the cherry industry and funding organizations, continued support from funding sources.

Objective 2: Improve tree and vineyard training and growing systems

Action:

- Evaluate training systems for growing sweet cherry on dwarfing rootstocks, both for processing and for fresh market.
- Fine tune training systems for the new tart varieties Balaton and Danube.
- Evaluate training systems for wine grape production in northern Michigan.
- Evaluate training systems for important new apple varieties and rootstocks.

Evaluation:

Programs on current research results, observations, and potential benefits. Field demonstrations and informal meetings with growers. Annual reports to the cherry industry and funding organizations; continued support from funding sources.

Objective 3: Evaluate new rootstocks and cultivars to improve the economic competitiveness of Michigan's fruit industry.

Action:

- Conduct cultivar evaluations on sweet and tart cherries, wine grapes, plums, apples and chestnuts, with smaller plantings of pears, apricots, and peaches.
- Continue to be the primary site for tart and sweet cherry rootstock evaluation in Michigan.
- Evaluate the adaptation of other (non-cherry) rootstocks to our soils, as appropriate, in accordance with funds, space and need.
- Evaluate processing and marketing characteristics of promising tree fruit cultivars.

Evaluation:

Consultations with processors, presentations at horticultural meetings, discussions with researchers, articles in trade and scientific publications, annual reports to funding organizations.

Objective 4: Evaluate horticultural practices that improve fruit quality throughout the cycle of growing, handling and processing fruit.

Action:

- Improve quality and/or production efficiency through use of plant growth regulators in horticultural production.
- Research improved horticultural practices to minimize the predisposition of tart cherries to softening.
- Improve harvesting and handling methods to minimize cherry softening.
- Conduct maturity studies to optimize fruit maturity and maximize quality (apples, wine grapes, sweet cherries).
- Continue to evaluate and disseminate maturity information to the northwest Michigan apple industry.

Evaluation:

Annually assess progress on improving fruit quality. Presentations to grower organizations and grower meetings. Solicit feedback from advisory groups (Balaton Marketing Committee, Michigan Cherry Committee, etc.). Consult with processors and fresh packers.

III. VALUE ADDED PROCESSING, MARKETING, AND FRUIT FARM FINANCIAL MANAGEMENT

Goal: NWMHRS will be a major source of information and assistance to the fruit industry in the marketing of existing and new fruit crops.

Objective 1: Determine the handling systems and harvest timing for Balaton and Danube in order to meet the fresh and processing market needs and requirements.

Action:

- Improve technologies for harvesting, handling, and packing fresh market tart cherries with a focus on the new tart cherry varieties Danube and Balaton.
- Develop maturity guidelines for various Balaton market niches.

Evaluation:

Continue to evaluate methodologies and procedures with the Balaton Marketing Committee, fresh packers, and other industry representatives.

Objective 2: Enhance Montmorency production practices so that Michigan can better compete in the dried cherry market.

Action:

- Meet with the dried cherry processors to discuss fruit growing characteristics that will improve drying yields.
- Determine the additional research required to meet the above characteristics.
- Develop the means to enable growers to produce the desired raw fruit characteristics for dried cherries (i.e. brix requirements, fruit firmness, etc).

Evaluation:

Annually obtain informal feedback from drying processors on whether the various means developed are achieving higher drying yields.

Objective 3: Determine the desired characteristics of cherries and wine grapes that best meet the needs of juice, wine and health benefits markets.

Action

- Cooperate with the MSU Enology Program to evaluate the quality of wines produced from our grape cultivar evaluation trial.
- Meet with the juice/concentrate processors, vintners and buyers in the health benefits industry to assess the fruit characteristics needed.
- Determine additional research needed to provide handling and growing systems to achieve these characteristics.
- Develop methods for growers to employ to provide these characteristics.

Evaluation: Fruit Agents, Parallel 45, and CMI will track the number and amount of grants awarded.

Objective 4: Determine what is necessary to produce fruit to meet current and emerging specialized market opportunities. Assist NW Michigan fruit growers in developing market niches and exploiting competitive advantages.

Action

- Meet with processors and packers to identify fruit quality characteristics for various markets.
- Develop methods for growers to use to attain these quality characteristics.
- Establish and maintain fruit plantings and develop growing systems for new crops (e.g. chestnuts), new varieties (e.g. Balaton) new markets (e.g. organic)
- Communicate with NW Michigan growers about opportunities and their interests.
- Utilize grower sites to do some of this research.

Evaluation:

Assess whether the research provides the fruit quality that meets or exceeds market expectations. Monitor the development of new, niche markets and emerging trends in existing markets.

Objective 5: Develop tools to help optimize fruit farm financial management.

Action

- Work with growers regarding financial implications of both short and long term management decisions.
- Tailor financial management information to meet the needs of the fruit industry
- Assist industry in their efforts to maximize profits
- Provide short & long-term orchard leasing templates
- Update "Cost of Production" bulletins for tart and sweet cherries every five years

IV. PUBLIC EDUCATION

Goal: NWMHRS will continue to be a primary source of information for the general public about the fruit industry, research and related issues.

Objective 1: Provide information to the public about the fruit industry and related topics in a proactive manner, to increase understanding of agriculture.

Action:

- Continue to work with the media to place and disseminate stories about NWMHRS research and outreach activities.
- Coordinate information dissemination with CMI, Michigan Apple Committee, and other state and local organizations.
- Work closely with The National Cherry Festival's Cherry Promotion Committee.
- Continue the “*Cherry Connection*”.
- Communicate with legislators and other policy makers about the Station and the fruit industry.

Evaluation: Station staff will keep track of stories in the media and will meet at least annually with representatives from CMI and the Cherry Promotion Committee. Meet as appropriate with other state and local organizations.

Objective 2: Assist youth in understanding agriculture and scientific methods.

Action:

- Implement a comprehensive, youth-based education program, including classroom and on-site visits.
- Pursue funding for the development of a curriculum that can be incorporated into existing school curricula.
- Work with local districts to implement and evaluate the curriculum

Evaluation:

Within the school year a member of the Station Staff will interview teachers and school administrators about the curriculum and will make at least one classroom visit during times in which the curriculum is taught.

OVERALL EVALUATION AND NEEDS ASSESSMENT

For each annually funded research project, members of the NWMHRS staff and/or researchers will report annually to the organizations that provide research funding. Reports on projects that are funded for a longer term will be made as results become available. Periodic reports will also be made to the Foundation Board, local horticultural organizations, industry groups and fruit growers on results, trends and/or impacts evidenced by research and outreach activities. Informal follow-up discussions will take place with industry leaders to assess the efficacy of results and to gain the industry's assessment of the accuracy of trend analysis.

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