**Brief Summary of Program**

Cornell University has a commitment to agriculture, horticulture, and natural resources enterprises and assisting them in making the best choices when selecting production principles and practices to enhance economic and environmental sustainability. We provide comprehensive research and education programming focused on assessing existing and new production-management practices and techniques with special emphasis on agricultural environmental management. As part of our strategy, we emphasize integration of research and extension to accelerate: identification of problems, focusing scientific effort to resolving problems, field-testing and evaluation of technology and cultural practices, and implementation of environmentally superior innovations/practices for the agricultural, horticultural, and natural resource communities.

**Situation and Priorities Statement**

Improving production efficiency, quality and safety of plants and animals in agricultural, horticultural, and natural resource production systems is fundamental to improving our ability to compete in a global economy. Managers of New York’s more than 40,000 farms and horticultural producers, and 3,000+ natural resource producers face dynamic and complex production environments. Extensive knowledge and skill is needed for identifying, selecting, and adopting principles and practices that optimize production management and improve profitability and sustainability in accordance with business goals. Technologies such as genetic engineering, satellite imagery and GIS, computer aided management decision tools and the like were in exploratory phases a decade or less ago but are readily available today for adoption and use. Technical assistance providers have similar needs to remain up-to-date and able to provide appropriate recommendations for each enterprise.

Production improvements can be accomplished through: 1) incorporating established and new practices and technologies; 2) traditional and modern genetics which select for desired traits (such as yield, flavor and pest resistance) and an understanding of how they can be expressed under different environmental regimes; 3) improving our understanding of the nutritional requirements for plants and animals so that inputs and waste products are minimized; 4) improving our understanding of soils and soil management techniques in order to maintain or improve the health of the soil and reduce losses to the environment; 5) improving our understanding of the impact of environmental conditions on plant and animal production.

Protecting and improving the integrity of our environment and maintaining ecological systems enables human prosperity. Expanding human populations cause growing consumer demands on the agriculture and food system. This magnifies the challenges of balancing food production and processing with land stewardship and protection of the environment. The long-term sustainability of agriculture is inexorably linked to environmental quality.

Specific emphasis is placed on: assessing existing and new production-management practices and techniques; improved product handling and storage to maintain quality and safety; crop choices for sustainability and profitability; and improving production efficiency through adoption of best management practices. We place special emphasis on agricultural environmental management including topics such as: potential environmental impacts of practices; requirements and opportunities of environmental regulations and programs; whole farm systems including integrated nutrient management, integrated pest management and environmental protection; waste management and recycling methods for sustainable agricultural production and environmental protection; water conservation and protection measures; and soil health management and protection. New regulations and guidelines, including the Confined Animal Feeding Operations regulations, have created opportunities for more multi-disciplinary research, for example, precision animal feeding as an aspect of nutrient management on farms and nutrient management as an aspect of watershed management.

**Assumptions**

- Producers, horticultural business people, and natural resource managers often are not fully aware of or skillful in managing production principles and practices that may help optimize their operations for economic and environmental sustainability.
- Producers, horticultural business people, and natural resource managers often are not fully aware of potential environmental impacts of their operations and/or requirements and opportunities of environmental regulations and programs.
- Technical assistance providers relied upon by producers, horticultural business people, and natural resource managers have parallel needs for current information on appropriate production practices.
- In most cases, it is possible to simultaneously meet economic and environmental sustainability goals.
- Integrated system approaches are needed to expand our understanding of trade-offs and develop BMPs that better address current and future challenges as well as food safety.
Target Audiences

Key audiences served, directly and indirectly include: established producers; new and young producers, consultants and service providers, input suppliers, governmental agencies, and local and state agricultural leaders.

Ultimate Goal(s) of the program

- Agriculture remains an important contributor to the economic and social health of New York communities.
- Producers, horticulture businesses, and natural resource managers optimize production management and improve profitability and sustainability in accordance with their goals.
- Increased use of sustainable practices results in improved or protected soil, air and water quality and production of high quality and safe food and fiber.
- Improved soil health and productivity, resulting in increased farm profitability and improved environmental quality.

**Note:** Only highlighted outcomes are collected in annual reporting.

### 1.2 Viable and Sustainable Production Practices (shared with NRE) – Part 1: Animal Production

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<th>Outputs</th>
<th>Near-Term Outcomes</th>
<th>Mid-Term Outcomes</th>
<th>Long-Term Outcomes</th>
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<tr>
<td>1.2.1 General Production Practices</td>
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<td>(1.2.1a) # producers, horticulture business persons, and/or natural resource managers completing education programs on existing and new production-management practices and techniques. (no target)</td>
<td>(1.2.1b) # of producers, horticulture business persons, and/or natural resource managers demonstrating knowledge/skill gains re existing/new practices and techniques; improved product handling and storage to maintain quality and food safety; and/or improving production efficiency through adoption of best management practices. (no target)</td>
<td>(1.2.1c) # of producers, horticulture business persons, and/or natural resource managers modifying existing practices and/or adopting new production management practices to address current issues and improve yield efficiency, consistency and/or quality. (1,200)</td>
<td>(1.2.1f) # of producers, horticulture business persons, and/or natural resource managers documented to have improved economic returns to agricultural business profitability and vitality resulting from enhanced production management practices. (500)</td>
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(1.2.1e) # technical assistance providers documented to have incorporated current best management practices in their recommendations. (100)
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<td>(1.2.2a) # producers, horticulture businesses, and/or natural resource completing education programs on potential environmental impacts of practices; requirements and opportunities of environmental regulations and programs; whole farm systems. (no target)</td>
<td>(1.2.2b) # of producers, horticulture businesses, and/or natural resource managers demonstrating knowledge/skill gains re environmental impacts of practices; environmental regulations and programs; whole farm systems including integrated nutrient management, integrated pest management; waste management; and water protection. (no target)</td>
<td>(1.2.2c) # of producers, horticulture businesses, and/or natural resource managers documented to have assessed potential environmental impacts of their operations and developed and acted on plans to eliminate or minimize those concerns. (1,500)</td>
<td>(1.2.2.e) # of producers, horticulture businesses, and/or natural resource documented to meet or exceed current environmental protection standards as a result of participating in relevant educational programs. (150)</td>
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<td>(1.2.2d) # of producers, horticulture businesses, and/or natural resource documented to have developed and implement nutrient management and/or waste management plans or modified existing plans to meet production and environmental goals and meet regulations. (250)</td>
<td>(1.2.2.f) # resource managers reporting reduced environmental concerns for participating enterprises. (20)</td>
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