The Center for Agriculture, Food and the Environment

UMass Extension
Mass. Water Resources Research Center
Mass.Agricultural Experiment Station
UMass Research and Education Farms

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Project Title: Sustainable Cranberry Production

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Project Overview

The cranberry industry in Massachusetts faces many challenges. Growers struggle to remain economically competitive and environmentally sustainable. It is anticipated that the industry may lose some acreage due to attrition and that smaller growers may sell their land. As with all farmers, energy costs are rising quickly, impacting the bottom line. Growers must develop and adopt innovative technology to remain competitive. The additional pressure of marketing fruit for export (foreign) markets that mandate restrictive thresholds for pesticide residues present yet another challenge. Growers must understand the biology of cranberry pests to properly utilize new management tactics. Additionally, they must contend with increasing urban pressure on the farm's margin as many parties compete for resources. The goal of the UMass Extension Sustainable Cranberry Project is to provide cranberry growers with pertinent and timely information so they may sustain their operations in Southeastern Massachusetts.

Situation & Priorities

The Cranberry Team works closely with a broad coalition that includes growers, consultants, professional associations, private vendors, non-profits, state and federal agencies, legislators, local officials and citizens. Extension staff, researchers, and partners consider options and focus efforts on the most critical needs and logical avenues. The Cranberry team convenes stakeholders to share information in a variety of formats that promote discussion and analysis of past, current and future issues in cranberry production and research.

The Cranberry Team will target the Parent Plan of Food Security and will also include Environmental Stewardship. We will plan projects to develop new techniques to control primary pests of cranberry including dodder, perennial weeds, fruit rot, and cranberry fruitworm. We will also undertake projects that will increase our knowledge base about nutrient inputs and water use in cranberry production agroecosystems. We will conduct IR-4 trials as needed to gather residue data that will be necessary to obtain EPA registration for new compounds for pest control in minor crops. We will pursue grant monies to support applied field research to gather efficacy and use pattern data for new and available compounds. We will continue our educational outreach efforts via newsletters, workshops, and electronic media to inform our constituent audience about the most current methods in managing pest populations in an integrated and environmentally sustainable way. In 2016, we plan to offer focused educational programs related to resistance management for insects, diseases, and weeds as well as educate growers on water conservation and efficient water use practices.

Stakeholder Input

The primary stakeholders are the MA cranberry growers, however, the general citizenry of MA is also included as well as cranberry growers from other regions in the United States and Canada. We work closely with grower organizations, such as the Cape Cod Cranberry Growers Association (CCCGA) and The Cranberry Institute for input concerning our applied research projects. The CCCGA Research Committee publishes Research Priorities each year and we align our applied projects with those priorities to obtain industry-related grant support. We also establish grower advisory panels as needed to provide input and guidance for particular grant programs (e.g., SARE, EPA, NE-IPM) as needed.

Evaluation Overview

We are fortunate to have a close working relationship with our constituents. This allows us to gauge implementation of specified indicators via personal conversations and small group workshops. The issuance of research priorities by the CCCGA also provides feedback as to whether we are providing appropriate information and data for the industry. We periodically conduct written and phone surveys to gauge grower adoption and implementation of management practices. Ocean Spray Cranberries, Inc. have been providing pesticide use data on a 2-year cycle (2005-2013) and this gives actual data by which we can evaluate changes in use patterns for cranberry pesticides.

Activity Summary - 2015

- Annual Meeting - Cranberry Management Update (1)
- Bogside Workshops (6)
- Cranberry Station Newsletter (7)
- Cranberry Station web site (1)
- Development of BMPs for maintaining and enhancing native pollinator habitat (1)
- Graduate Student Applied Research (7)
- Implementation of tile drainage for improved cranberry health and pest management (1)
- Research in support of reduced-risk pesticide registration (1)
- Use of analytic hierarchy process (AHP) to determine grower preferences for integrated management of dodder, a serious weed pest in cranberry (1)
- Cranberry diagnostic and management recommendation services (1)

Total educational contacts

	Adult Contacts
In Person	1359
Indirect Contacts (Print, Web, etc…)	17945

Narrative Summary and Impact

2015 was a productive year for the Sustainable Cranberry Production team. We held a series of successful meetings that were well attended by our grower clientele. Specifically, 207 growers attended the Annual Management Update meeting (regular and make-up) as well as a separate meeting on pesticide safety (attended by 74 people). We published 7 issues of the Cranberry Station newsletter, which was distributed to 253 recipients; most are in Massachusetts, but 12 were national or international addresses. Our Diagnostic Lab reported 40 samples processed and 45 field visits made to diagnose issues.

The UMass Cranberry Web site tallied (Google Analytics) 11,915 users between October 1, 2014-September 30, 2015. We had 35, 376 page views with 27,132 unique page views on the site (17,692 entrances onto the site) during that time. Visitors spent an average of 1:32 minutes on the site. The top 5 visited pages were "How Cranberries Grow", Weather, Personnel, Chart Book, and IPM message alerts. The top 5 longest average times spent on a page were for: Pesticide Mixing BMP (11:19 minutes), Animal Damage BMP (7:43 minutes), Water Control Structures BMP (6:23), Chemigation BMP (6:07), and Recipes (5:21). Most users (90%) were from the U.S. but visitors were also from UK (2.3%), other English-speaking areas (1.1%) and several hundred people from France, Poland, Spain, Canada, and Germany. Most users accessed the site via desktop computers (66%) but 22% used mobile devices and 11% used tablets.

During the past year, we continued our research work on phosphorus use in cranberry systems and its impact on water quality. Work continues on the use of automated irrigation for frost protection and irrigation. We did not have an IR4 project in 2015. The impact of old and new chemistries on bee activity were also monitored. Our team supported the work of 3 graduate students. Many of our publications and presentations are posted on ScholarWorks (see metrics below).

Project Summary-Impacts

Our 2015 meetings provided educational outreach to 401 attendees, and allowed 235 attendees to obtain 873 contact hours towards pesticide recertification. Based on survey data (N=66 to101 respondents from 176 attendees) from our January 2015 Update Management meeting (full-day meeting), 41 and 22 (how weed biology affects management), 42 and 30 (general weed management), 45 and 27 (fruit rot management), 50 and 18 (new cranberry virus), 45 and 12 (nitrogen movement), 27 and 8 (tile drains), 42 and 11 (P loss in floodwaters), 23 and 16 (frost cycling), 49 and 23 (pollination update), 36 and 26 (using adjuvants), and 51 and 23 (insect outbreaks) growers got new information and/or got information they will likely use on their farm, respectively. Based on survey data (N=20 to 25 respondents from 31 attendees) from our February Make-up Meeting 2015 Update Management meeting (pest-oriented presentations only; meeting was a half-day instead of a full day), 10 and 4 (how weed biology affects management), 12 and 5 (general weed management), 11 and 6 (fruit rot management), 16 and 4 (new cranberry virus), 10 and 3 (pollination update), 11 and 6 (using adjuvants), and 12 and 5 (insect outbreaks) growers got new information and/or got information they will likely use on their farm, respectively. The relevant topics for the responses are in parenthesis.

Web access continues to be an excellent resource for our constituents and people interested in sustainable cranberry production. Many of our fact sheets, presentations, and publications are available on Scholarworks, a digital repository. Based on the metrics generated by BeePress (which supports Scholarworks for UMass), visitors to the Scholarworks site downloaded 1,036 copies of various sections

the UMass Cranberry Station Chart Books (-48% from last year), 371 copies of the Cranberry Production CP-08 (Executive Summary and Full) Manuals (+48% from last year), 678 copies of BMPs (-38% from last year; IPM was downloaded most frequently, 215 times), 2,154 copies of our Extension PowerPoint presentations (-14% from last year; pesticide compatibility chart was the most popular with 200 downloads), and 331 fact sheets (-21% from last year; physiology of cranberry yield was the most popular with 110 hits).

Collaborating Organizations

- **Cape Cod Cranberry Growers Association**
- **Cranberry Institute**
- **Ocean Spray Cranberries, Inc.**
- **Cranberry Research Foundation**