MICHIGAN STATE UNIVERSITY | Extension

MSUE Small Fruit Program:

Educational Programs & Technical Assistance to Growers in West Michigan





Dr. Carlos Garcia Salazar
MSU Extension District 6 & 7

MICHIGAN STATE UNIVERSITY | Extension

Current activities

- Integrated Pest Management
- Environmental Impact of Road Salt on blueberries
- Food Safety
- Farm visits

MICHIGAN STATE UNIVERSITY | Extension

Small Fruit Industry: **Major Challenges**

- New invasive insect pests
  - The Spotted Wing Drosophila (SWD)
  - The Brown Marmorated Stink Bug (BMSB)
- Food Safety
- Road Salt application.

- 100 yrds into the field aerosols created by rd salt & car interaction.

- education of insecticide & damaging affects.

MICHIGAN STATE UNIVERSITY | Extension

Major Challenges: New invasive insect pests

The spotted wing drosophila (SWD)

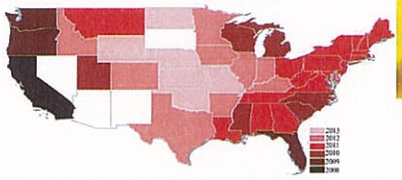
Invasive pest of berries, stone fruit, grapes, and some pome fruit crops. Native to Asia detected in North America for the first time in 2008 in California.

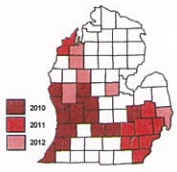
Since then, it has spread throughout many of the primary fruit production regions of the United States, including Michigan.

MICHIGAN STATE UNIVERSITY | Extension

Major Challenges: New invasive insect pests

The Spotted Wing Drosophila (SWD)





SWD was first detected in Michigan in 2010. By 2013, it has been detected in 28 counties, and we expect that this fly may distribute throughout the southern peninsula. The SWD has been found in farms, gardens, rest areas, and wild areas suggesting that it is well-established in the region.

MICHIGAN STATE UNIVERSITY | Extension

The SWD Economic Impact

- In 2012, growers estimated in $23.9 and $2.7 million the economic losses caused by the SWD on the blueberry and raspberry industry.
- In addition, growers had to spray more pesticides for SWD control. That increased the production costs and impacts to the environment and worker health.
- The cost of controlling the SWD increased from an average of $150 in 2012 to $250 in 2013

MICHIGAN STATE UNIVERSITY | Extension

The SWD Economic Impact to Minority and Underserved Growers .....

Hispanics

- There are approximately 82 blueberry growers with small farms with less than 20 acers of blueberries.
- In 2013, eight growers reported losses of $147,200 due to SWD. The previous year their income was $180,100.

Amish growers

- In west central Michigan, they grow less than one acre of berries but berry sales can make up to 20-30 of their family income. In 2013, most growers lost 50% of their raspberry and strawberry crops and they had to abandon to crop after unable to control the SWD infestations.

MICHIGAN STATE UNIVERSITY | Extension

MSUE Response: Spotted Wing Drosphila

- Since 2010 Michigan's small fruit growers are fighting a new threat, the **Spotted Wing Drosophila**. In response, the MSUE Small Fruit Program is offering classroom and hands-on training to growers, consultants, and IPM practitioners to help them to successfully identify, monitor, and manage the SWD threat.

MICHIGAN STATE UNIVERSITY | Extension

Biggest obstacles for implementing a successful SWD control (Michigan 2013)

Issue	No an obstacle	Important Obstacle
Scouting & monitoring for SWD	55%	45%
Management of insecticides	21.5%	78.5%***
Spray problems	20%	80%
No enough insecticides registered for my crop	27%	73%

*** Growers do no understand how insecticides work and tend to take the MSUE recommendations as "prescriptions"

MICHIGAN STATE UNIVERSITY | Extension

MSUE Response: Advanced IPM for SWD Chemical Control and Management

Carlos Garcia-Salazar, Rufus Isaacs, and Steve Van Timmeren

MSU Department of Entomology
MSU Extension Agriculture and Agribusiness Institute

MICHIGAN STATE UNIVERSITY | Extension

MSUE Response....

- From 2012 to 2014, 7 workshops to train growers to help them to re-tool their IPM programs to incorporate the SWD control.
  - **Total trainees: 187**
  - **Caucasian: 166 (120 male and 46 female)**
  - **Hispanic: 13 (10 male and 3 female).**
- **SWD workshop for Hispanics & African American**
  - **2013 12 growers (8 male and 4 female).**
  - **2014 21 grower (male)**
  - **Total minority trainees: 33**

MICHIGAN STATE UNIVERSITY | Extension

2013 Impact of SWD Workshops

- In November 2013 we evaluated the impact of the SWD training program. Result from 33 participants that responded our survey gave the following impact.
  - **Number of acres protected: 2,458**
  - **Volume of blueberries protected:15.06 million pounds**
  - **Value of crop protected: $12.8 million dollars.**
- The cost of control SWD increased from an average of $150 in 2012 to $250 in 2013. Most growers that followed all MSU Extension recommendations applied less insecticides that those that did not

MICHIGAN STATE UNIVERSITY | Extension

Major Challenges:
The Brown Marmorated Stink Bug (BMSB)

Halyomorpha halys, a stink bug native of Asia was first collected in 1998 in Allentown, PA, since then it has been found all over the USA including Michigan.

Current Distribution of BMSB in the United States

- Severe Agricultural and Nuisance Problems Reported
- Nuisance Problems Only
- Detected

Tracy C. Leskey, USDA-ARS. http://www.epa.gov/oppbppd1/biopesticides/nafta-workshop-slides/leskey-epa-nafta-workshop.pdf

MICHIGAN STATE UNIVERSITY | Extension

MSUE Response: BMSB

- **The BMSB.** In 2014, the MSUE fruit team implemented a network of monitoring sites across Michigan.
- Monitoring sites include tree fruit and small berry fields in Allegan, Ottawa and Kent County.
- BMSB traps are checked once a week and the data collected recorded and published weekly at the MSU News web site.
- So far, no BMSB has been found at fruit farms in west Michigan.

MICHIGAN STATE UNIVERSITY | Extension

Major Challenges: Deicing Road Salt

- Deicing salt is an important tool in maintaining safe roads in West Central Michigan. The Midwest Snow and Ice Group reported in 2007, Michigan's state road total accumulated tons of road salt per lane mile were 24.4.
- In Ottawa County, the Road Commission (OCRC) maintains 1,291 miles of local and primary roads and 252 miles of state Trunkline.
- In a typical winter season the OCRC conducts on average 50 snow removal operations and applies between 20,000 to 25,000 tons of salt. OCRC (2013).

MICHIGAN STATE UNIVERSITY | Extension

Deicing Road Salt Economic Impact

- In 2003, the blueberry industry estimated in $682,000 the economic losses due to lost yield and plant mortality (Garcia-Salazar et al. 2011).
- In 2013, the Ottawa County Road Commission estimated the cost of road salt application to maintain 1,291 miles primary roads and 252 miles of state Trunkline in more than $3.7 million annually.
- The economic impact does not include the damage to vehicle, infrastructure and environment.

MICHIGAN STATE UNIVERSITY | Extension

MSUE Response: IRSM to reduce impacts on fruit crops and water resources in West Michigan

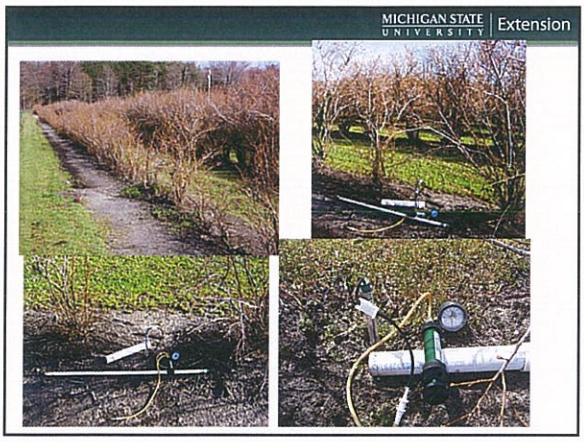
Dr. Carlos Garcia-Salazar

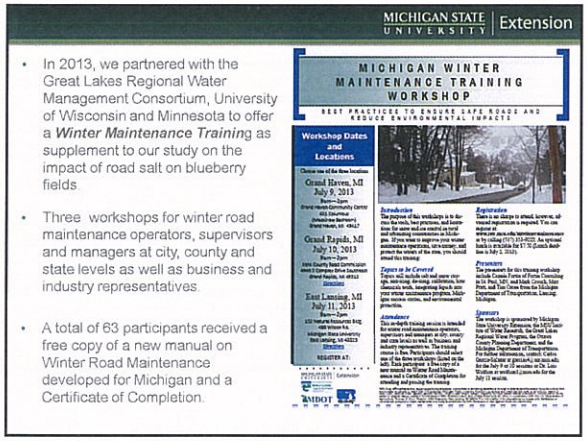
MSU Extension-Ottawa County, MI

MICHIGAN STATE UNIVERSITY | Extension

Monitoring and Evaluation of the OCRC IRSMP

- Since 2005 the Ottawa Road Commission implemented an Integrated Road Salt Management Program (IRSMP) to ameliorate the deleterious impact of road salt on blueberry fields facing roads salted during winter.
- MSU Extension has been evaluating IRSMP's effects on preventing blueberry dieback in affected fields.
- The evaluation allowed us to make comparisons between winter dieback in the presence or absence of roads salt, and make recommendations to the OC Planning and Performance Improvement Department.


MICHIGAN STATE UNIVERSITY | Extension

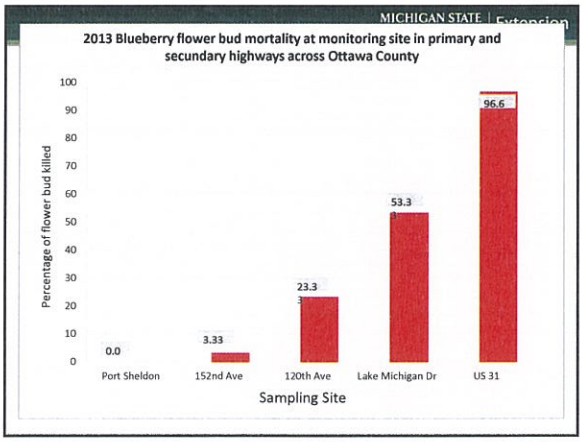

MICHIGAN STATE UNIVERSITY | Extension
In 2013, we partnered with the Great Lakes Regional Water Management Consortium, University of Wisconsin and Minnesota to offer a Winter Maintenance Training as supplement to our study on the impact of road salt on blueberry fields.
Three workshops for winter road maintenance operators, supervisors and managers at city, county and state levels as well as business and industry representatives.
A total of 63 participants received a free copy of a new manual on Winter Road Maintenance developed for Michigan and a Certificate of Completion.
MICHIGAN WINTER MAINTENANCE TRAINING WORKSHOP
BEST PRACTICES TO ENSURE SAFE ROADS AND REDUCE ENVIRONMENTAL IMPACTS
Workshop Dates and Locations
Grand Haven, MI
July 9, 2013
Grand Rapids, MI
July 10, 2013
East Lansing, MI
July 11, 2013
REGISTER AT:


Michigan Winter Maintenance Handbook
Promoting safe roads and clean water
This material is based upon work supported by the USDA-NIFA under award No. 2012-48691-20334
Applying knowledge to improve water quality
Great Lakes
Regional Water Program
A Partnership of USDA NIFA & Land Grant Colleges and Universities

MICHIGAN STATE UNIVERSITY | Extension

Road Salt & Winter damage 2103

- Despite the efforts of the Ottawa County Road Commission to ameliorate the impact of road salt on blueberry fields alongside major highways, fields located in close proximity to US 31 and M-45 continue suffering extensive damage during winter.
- However, the OCRC has succeed in reducing the damage in secondary roads like Port Sheldon or Ransom Street to levels similar to those observed in non salted roads.



MICHIGAN STATE UNIVERSITY | Extension

Major Challenges:
Food Safety for Small Fruit Production

- At a time when Michigan's economy is coming out of the recession the implementation of the FSMA legislation to deal with emerging food safety concerns threaten the success of small underserved and minority producers.
- Lack of proper training on food safety would damage the competitiveness of Michigan's fruit industry with devastating effects on most underserved growers.
- Growers' compliance with FSMA requires knowledge and hands-on experience to develop food safety risk management skills needed to meet its requirements.

MICHIGAN STATE UNIVERSITY | Extension

Economic Impact:
Food Safety for Small Fruit Production

- Small blueberry growers tend on average 12 acres with an average yield of 3,000 lb/acre. In 2010, GAP certified growers had no problem selling their crop at $0.80 per pound or more (average income of $28,800 per farm).
- Growers, who did not comply, *if* able to sell, received on average $0.30 or less per pound (average income of $10,800 per farm).

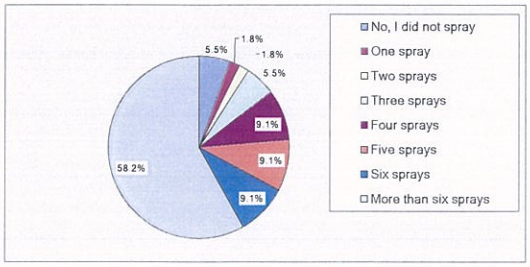
MICHIGAN STATE UNIVERSITY | Extension

NEW CHALLENG:
Food Safety for Small Fruit Production

- Extensive use of pesticides to combat the SWD is creating food safety risks:
- Pesticide residues on fruit
- Pesticide exposure for workers and growers

MICHIGAN STATE UNIVERSITY | Extension

Number of insecticide applications against SWD in 2013



MICHIGAN STATE UNIVERSITY | Extension

MSUE Response: IRSM *A Risk Management Educational Program: GAP for Food Safety in Blueberry Production*

FIGHT BAC! Keep Food Safe From Bacteria

Dr. Anamaría Gómez-Rodas[1] Dr. Carlos García-Salazar[2], Dr. Leslie Bourquin[3] and Dr. Annemiek Schilder[4]

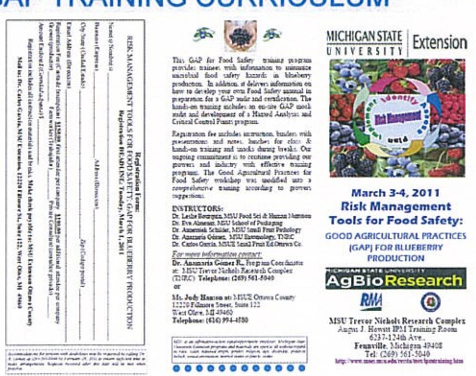
MICHIGAN STATE UNIVERSITY | Extension

OBJECTIVES:

- **Objective 1.** Develop a training program on Good Agricultural Practices (GAP) for food safety to help blueberry producers, especially disadvantaged and underserved, to make sound food safety risk management decisions.
- **Objective 2.** Facilitate adoption of GAP for food safety by underserved producers by providing *specific guidelines or protocols tailored for blueberry production.*
- **Objective 3.** Implement and deliver a training program to facilitate adoption of GAP for food safety by underserved producers.

MICHIGAN STATE UNIVERSITY | Extension

GAP TRAINING CURRICULUM



Registration Form:
RISK MANAGEMENT TOOLS FOR FOOD SAFETY: GAP FOR BLUEBERRY PRODUCTION

This GAP for Food Safety training program provides trainees with information to minimize microbial food safety hazards in blueberry production. In addition, it delivers information on how to develop your own Food Safety manual in preparation for a GAP audit and certification. The hands-on training includes an on-site GAP mock audit and development of a Hazard Analysis and Critical Control Points program.

Registration fee includes instruction, binders with presentations and notes, lunches for class & hands-on training and snacks during breaks. Our ongoing commitment is to continue providing our growers and industry with effective training programs. The Good Agricultural Practices for Food Safety workshop was modified into a comprehensive training according to growers suggestions.

INSTRUCTORS:
Dr. Leslie Bourquin, MSU Food Sci & Human Nutrition
Dr. Eva Almenar, MSU School of Packaging
Dr. Annemiek Schilder, MSU Small Fruit Pathology
Dr. Anamaría Gómez, MSU Entomology, TNRC
Dr. Carlos García, MSUE Small Fruit Ed Ottawa Co.

For more information contact:
Dr. Anamaría Gómez R., Program Coordinator at: MSU Trevor Nichols Research Complex (TNRC) Telephone: (269) 561-5040
or
Ms. Judy Hanson at: MSUE Ottawa County
12220 Fillmore Street, Suite 122
West Olive, MI 49460
Telephone: (616) 994-4580

MICHIGAN STATE UNIVERSITY | Extension

Identify Assess Implement Risk Management

March 3-4, 2011
Risk Management Tools for Food Safety:
GOOD AGRICULTURAL PRACTICES (GAP) FOR BLUEBERRY PRODUCTION

MICHIGAN STATE UNIVERSITY AgBioResearch

RMA

MSU Trevor Nichols Research Complex
Angus J. Howitt IPM Training Room
6237-124th Ave.,
Fennville, Michigan 49408
Tel: (269) 561-5040

MICHIGAN STATE UNIVERSITY | Extension

CLASSROOM SESSIONS

DATES: Thursday, March 3, 2011

8:30-9:00 a.m. REGISTRATION

- 9:00 - 9:45 Introduction to GAP for Food Safety
- 9:45 - 10:30 Pre & Post Harvest Microbial Contamination
- **10:30 - 10:40 BREAK**
- 10:40 - 11:25 Hazard Analysis and Critical Control Points (HACCP)
- 11:25 - 12:10 Worker Health & Hygiene

12:10 p.m. - 1:00 p.m. LUNCH (Provided)

- 1:00 - 1:45 Field Sanitation
- 1:45 - 2:30 Water Quality
- **2:30 - 2:40 BREAK**
- 2:40 - 3:25 Pesticide Safety
- 3:25-5:00 USDA GAP Check List

Friday, March 4, 2011

HANDS-ON:

Classroom

- 9:00 - 10:30 How to develop your HACCP plan
- **10:30 - 10:40 BREAK**
- 10:40 - 12:05 Blueberry Postharvest Shelf-life Extension using Packaging Technologies

12:05 p.m. - 1:00 p.m. LUNCH (Provided)

- 1:00 - 2:20 How to develop your Food Safety manual

FIELD HANDS-ON:

- 2:20 - 5:00 Conducting an Effective Farm Internal Audit: Mock Audit at a local blueberry farm

5:00 p.m. Adjourn.

WHY DO YOU NEED TRAINING ON GAP FOR FOOD SAFETY ?

GROWERS :

- Most buyers **REQUIRE** that YOU be **GAP Certified** to accept your fruit.
- To save **TIME** & **MONEY** during the GAP audit.
- With a GAP program YOU can reduce contamination risks and provide ***safe*** and better **quality** produce
- With a GAP program YOU get easy **access** to local and national markets .
- To **PREVENT** costly litigations if a food safety incident occurs.

PACKERS OR SHIPPERS:

- Learn how to conduct your own Internal Auditing.
- Learn to identify possible Hazards and Critical Points in your operation.
- To comply with your buyer FOOD SAFETY standards.
- If you are planning to EXPAND your operation into international markets.

Send your personnel to be trained in our GAP for FOOD SAFETY Training!

MICHIGAN STATE UNIVERSITY | Extension

Blueberry CROP SPECIFIC GAP MANUAL

MICHIGAN STATE UNIVERSITY EXTENSION

MICHIGAN AGRICULTURAL ENVIRONMENTAL ASSURANCE PROGRAM

RMA

Good Agricultural Practices for Food Safety in Blueberry Production:
Basic Principles

Prepared by

Anamaria Gómez Rodas, Lev Bourquin, Carlos Garcia Salazar, Anamaria Varela Gómez and John C. Wise

Department of Entomology, Trevor Nichols Research Complex; Department of Food Science and Human Nutrition, MSU Extension Central Region - Ottawa County

MICHIGAN STATE UNIVERSITY | Extension

CURRICULUM TRY-OUT

Food Safety Training in ACTION!

"Mock" Audit Hands-on Try-out

MICHIGAN STATE UNIVERSITY | Extension

2012 Demographics of GAP training

- Total number of growers trained under the GAP program =129
  - African American, 8;
  - Hispanics, 57,
  - Caucasian, 64.
- These included 47 females, 19 of them Hispanics.

MICHIGAN STATE UNIVERSITY | Extension

IMPACTS

Increased GAP adoption — Our "Food Safety Manual" is facilitating the adoption of GAP for FS by underserved growers. Overall, in 2012 our training program provided assistance to facilitate GAP certification of 5,049 acres of blueberries. That is approximately1/3 of the blueberry harvested area.

MICHIGAN STATE UNIVERSITY | Extension

Current status of the GAP program

Since 2012, our GAP for Food Safety Training Program has been unable to provide the much needed support to the blueberry industry, especially to underserved and minority fruit growers.

Only update on FSMA have been provided at Twilight Meeting conducted every year as a part of our IPM program.

MICHIGAN STATE UNIVERSITY | Extension

Future Needs for the small fruit program

- Funding for more IPM training to help minority and underserved small fruit growers to retool their IPM to account for the SWD risk.
  - Provide more direct assistance to Hispanic growers.
- Reestablish the GAP program for blueberry growers and other underserved small fruit producers.
- Continuing with the IRSMP to limit use of road salt in West Michigan to ameliorate damage to fruit crops.
- Funding to deliver MSUE programs to minority and underserved growers lacking access to electronic media; more than 40% do not have access.