WEEKLY CROP UPDATE
UNIVERSITY OF DELAWARE COOPERATIVE EXTENSION

Volume 22, Issue 20 **August 8, 2014**

Vegetable Crops

Vegetable Crop Insects - *Joanne Whalen, Extension IPM Specialist*; jwhalen@udel.edu

Cole Crops
As soon as plants are set in the field, be sure to sample for cabbage looper and diamondback larvae. A treatment will be needed before larvae move into the hearts of the plants. We are also starting to see the first Harlequin bugs in cole crops, especially kale. In general, most of the "worm" materials are not effective on Harlequin bugs. The pyrethroids have provided control in years past.

Lima Beans
As soon as pin pods are present, be sure to watch carefully for plant bug and stinkbug adults and nymphs. As a general guideline, treatment should be considered if you find 15 adults and/or nymphs per 50 sweeps. Also be sure to begin sampling the earliest planted fields for corn earworm. A treatment will be needed for corn earworm if you find one corn earworm larvae per 6 foot-of-row.

Melons
Continue to scout all melons for aphids, cucumber beetles, and spider mites. We continue to see an increase in aphid populations as well see rind feeding from cucumber beetle adults and a variety of caterpillars. If beet armyworm is in the mix, it is important to select a material that is effective on this insect (refer to the Commercial Vegetable Production Recommendations) – the pyrethroids do not provide effective control.

Peppers
Depending on local trap catches, sprays should be applied on a 7 to 10-day schedule once pepper fruit is ¼ - ½ inch in diameter. Be sure to check local moth catches in your area by calling the Crop Pest Hotline (302-831-8851) or visit our website at http://agdev.anr.udel.edu/trap/trap.php. You will also need to consider a treatment for pepper maggot. Be sure to also watch carefully for beet armyworm larvae since they can quickly defoliate plants. In addition, be sure to use a material that provides beet armyworm control – the pyrethroids have not provided control of this insect in past years.

Snap Beans
You will need to consider a treatment for corn borer and corn earworm populations in processing and fresh market snap beans. Sprays are needed at the bud and pin stages on processing beans for corn borer control. As earworm trap catches increase, an earworm spray may also be needed at the pin stage. You will need to check our website (http://agdev.anr.udel.edu/trap/trap.php) or call the Crop Pest Hotline (302-831-8851) for the most recent trap catches to help decide on the spray interval between the pin stage and harvest for processing snap beans. http://extension.udel.edu/ag/insect-management/insect-trapping-program/ecb-and-cew-moth-catch-thresholds-for-processing-snap-beans/. Once pin pods are present on fresh

market snap beans, a 7 to 10-day schedule should be maintained for corn borer and corn earworm control.

Sweet Corn
Continue to sample all fields through pre-tassel stage for whorl feeders (corn borer, corn earworm and fall armyworm). A treatment should be applied if 12- 15% of the plants are infested with larvae (regardless of the species). The predominant whorl feeder continues to be the fall armyworm. Since fall armyworm (FAW) feed deep in the whorls, sprays should be directed into the whorls and multiple applications are often needed to achieve control. FAW can also be a problem in silk stage sweet corn, especially in outbreak years. The first silk sprays will be needed as soon as ear shanks are visible. Be sure to check both blacklight and pheromone trap catches since the spray schedules can quickly change. Trap catches are generally updated on Tuesday and Friday mornings on our website (http://agdev.anr.udel.edu/trap/trap.php) and the Crop Pest Hotline (302-831-8851). Information on scouting sweet corn and how to use the trap catch information can be found at http://extension.udel.edu/ag/insect-management/insect-trapping-program/action-thresholds-for-silk-stage-sweet-corn/.

Last Planting Dates

– *Gordon Johnson, Extension Vegetable & Fruit Specialist;* gcjohn@udel.edu

The following are latest planting dates for unprotected culture of vegetable crops on Delmarva:

For cucumbers (pickles and slicers), the latest planting date for Delmarva should be August 7. Experience has shown that after that date yields drop considerably. With summer squash, late plantings can be made until August 10.

Snap bean crops can be planted up to August 10.

Cole crop planting for fall harvest using transplants continues. Broccoli is transplanted up to August 20, cabbage up to August 10, and cauliflower up to August 10.

Kale and collards should be seeded before August 15 for best yields, transplants can go in up to August 30. Turnips and mustard greens can be planted from late July through the first week in September.

Beets are best planted before August 10 for roots, by August 20 for greens.

Green onions should be planted by the end of August for fall harvest. Overwintering green onions can be planted through October using hardy varieties.

Bulbing onions for overwintering should be seeded from September 1 through September 15 using overwintering specific varieties. Bolting will be a problem if planted too early. If using transplants, planting should not take place until October. Leeks are transplanted from August 1 through August 20. Garlic cloves are best planted November 1 through November 20.

Spinach for fall harvest is seeded August 10 through the end of August for fall harvest and from October 1 to October 20 for overwintering.

Lettuce for heads from direct seeding should be planted during August. Transplanted lettuce for heads best planted from August 10 to September 10. Fall adapted varieties are required. Earlier plantings may be subject to bolting and only bolt resistant varieties should be used. For baby lettuce, field plantings can continue through mid-September.

Plasticulture strawberries should be planted by September 15 for best results. Later plantings will require earlier row covering and risk lower yields.

For all late crops, variety selection is very important. For example, late planted cucurbits such as squash need broad virus resistance. For fall harvested crops, switch to shorter maturing varieties as plantings gets later. When planting late, remember that a few days delay in planting can mean several weeks later harvest. A longer maturing variety may not produce if planted too late. On the other hand, planting several maturities of varieties on the same day will often give long extended harvest in the fall for crops such as broccoli.

Protected culture using high tunnels, planting on black plastic, and using row covers will often require changes in planting dates. For example, lettuce and other leafy greens in high tunnels

can be direct seeded through early November. Overwintering crops in high tunnels should be planted much later than field plantings.

Virus Infections Common in Some Pumpkin Fields this Year

– *Jerry Brust, IPM Vegetable Specialist, University of Maryland*; jbrust@umd.edu

A number of pumpkin fields in Maryland have a great deal of virus infected plants (20-50%) while other pumpkin fields have none. Why the large differences in infection levels? This is something I have been looking at for the past two seasons. It has to do with what is around the pumpkin field and how long pumpkins and squash have been growing in the general area. I'll have more on the results of this study at this year's winter vegetable meetings. Almost all of the viruses found so far have been Watermelon mosaic virus-2 (WMV), with a small percentage being Zucchini yellow mosaic virus (ZYMV). The most common symptoms caused by these viruses are a leaf mosaic (variegated patterns of dark and light green to yellow that form a mosaic) and leaf distortion (Fig. 1). Symptoms may vary from plant to plant according to the species or varieties, viral concentration in the plant, timing of infection, single or mixed infection, or temperature. External symptoms may develop within four or five days after young plants become infected, but may take up to 14 days to develop when the foliage is older and more mature. Symptoms develop more rapidly at 80°-90°F than at 65°-75°F. Virus symptoms are more severe on plants exposed to short days or reduced light than on plants exposed to long days and bright light. Cucurbit plants rarely become infected in the seedling stage. When this does happen, the cotyledons may turn yellow and wilt. New leaves are slightly mottled a yellowish green and remain small, wrinkled, and distorted.

Typically, viruses affect pumpkin fruit by causing lumps, bumps and rings to appear on the skin of the fruit. However, at times there is little loss if the pumpkin fruit has been pollinated and begins to grow before virus infection occurs (Fig. 2). Figure 2 shows a pumpkin plant with a new WMV infection, the larger pumpkin fruit will develop normally, but the smaller fruit just pollinated will not develop at all and will be aborted by the plant. Infection just after pollination may cause the pumpkin fruit to have blotches or stripes of green or yellow color. If the plant is infected before pollination there usually is no fruit production, but if some are produced then symptoms on the fruit include surface discoloration, bumps and other fruit deformity, early browning, shrinking or death, small fruit size and poor yields. Secondary infection by other microorganisms may occur on the virus infected fruits and cause soft rot.

Figure 1. Pumpkin plant infected with WMV

Figure 2. Larger pumpkin fruit (yellow arrow) will develop normally while smaller fruit will not (red arrow)

On pumpkin plants, viruses can either infect the plant alone or together. If a plant is infected by only one virus, the symptoms generally are

milder (Fig. 3) than if by two or more (Fig. 4). Infection by two viruses initially causes a strong mosaic and distortion of leaves. Infected plants have smaller and smaller new leaves. Late stage infections consist of leaves that turn yellow or become scorched along the edge.

Figure 3. Pumpkin plant infected with one virus

Figure 4. Pumpkin plant infected with 2 viruses

Aphids transmit viruses to plants through their sucking mouthparts. Viruses that are non-persistently transmitted, as are most pumpkin viruses, are difficult to manage because the aphids acquire and transmit the viruses so quickly. The acquisition or transmission of non-persistently transmitted (NPT) viruses is completed in a matter of seconds or minutes. NPT viruses cannot spread very far from where they were originally acquired by the aphid. Pesticides sprayed on the plant will eventually kill the aphids, but too late to stop them from transmitting the virus. Therefore, insecticides have little effect on initial infection rates of NPT viruses transmitted by transient, non-colonizing aphids (these are aphids that are passing through the field, land on and taste the pumpkin plant, do not like it and move on, but they have transmitted the virus). Insecticides can control aphid honeydew production and secondary spread of viruses in the field.

Agronomic Crops

Agronomic Crop Insects – *Joanne Whalen, Extension IPM Specialist*; jwhalen@udel.edu

Alfalfa and Grass Hay Crops
Continue to watch for defoliators in grass hay crops and alfalfa. Significant damage can occur in grass hay fields from true armyworm and fall armyworm. It is important to catch populations before significant damage has occurred and when larvae are small. In addition to checking labels for rates, be sure to check for all restrictions including but not limited to comments on control under high populations and size of larvae; days to harvest and forage/silage restrictions. No thresholds are available; however, controls should be applied before significant defoliation occurs.

Soybeans
We are starting to see and hear reports of an increase in the presence of defoliators (especially Japanese beetles, grasshoppers, silver spotted skipper, green cloverworm and isolated spots of fall, yellow and beet armyworm) in both full season and double crop soybeans. As a general guideline, treatment decisions for defoliators should be based on the following defoliation thresholds:

(a) Full Season Plantings – 30% defoliation pre-bloom; 15% defoliation from bloom through the end of pod fill; 35% - once fully developed seeds are present

(b) Double Crop Plantings (especially if growth is poor) – 20% defoliation pre-bloom, 10% defoliation from bloom through pod fill; 15% defoliation - once fully developed seeds are present.

Continue to watch for an increase in stinkbug populations. Economic damage from stink bugs is most likely to occur during the pod development and pod fill stages. Brown marmorated stink bug populations still remain low and are only being found along field edges that border woods in New Castle County.

As far as corn earworm, we continue to find very low levels of small larvae, mainly in double crop fields. The results of the annual corn earworm survey in field corn in Virginia, which has been used as an indicator of the potential for corn earworm in soybeans, show that the populations are similar to 2013 but lower compared to the 2009 through 2012 survey results. (http://blogs.ext.vt.edu/ag-pest-advisory/). We also continue to see lower corn earworm trap catches in many locations throughout the state. However, if the weather changes this could change as well. Therefore, it will be important to check fields for corn earworm on a weekly basis. In the past, we have used the treatment threshold of 3 corn earworms per 25 sweeps in narrow fields and 5 corn earworms per 25 sweeps in wide row fields (20 inches or greater). These are static thresholds and a better approach to determining a threshold is to access the Corn Earworm Calculator (http://www.ipm.vt.edu/cew/) which estimates a threshold based on the actual treatment cost and bushel value you enter.

Moderately Resistant Wheat Varieties for Suppression of Deoxynivalenol (DON) –

Nathan Kleczewski, Extension Specialist - Plant Pathology; nkleczew@udel.edu

The fungus *Fusarium graminearum* causes Fusarium head blight (FHB) in barley and wheat. Infection of wheat heads by *F. graminearum* can result in reduced grain fill, bleaching, and the production of a mycotoxin known as deoxynivalenol (DON). Consumption of DON infested grain can result in nausea, vomiting, feed refusal, and reduced weight gain in many animals. As a result, DON levels are regulated by the FDA and many grain elevators test for elevated levels of the toxin (Table 1). If levels exceed a given level, for example 2 ppm for grain destined for human consumption, the load can be docked. In severe cases the load can be rejected.

Table 1. Deoxynivalenol (DON) Advisory Levels established by the FDA.

Maximum Allowable DON Level	Consumer
1 ppm	Humans
5 ppm	Swine and all animal species (except cattle and poultry). Not to exceed 20% diet for swine and 40% for other animals.
10 ppm	Ruminating beef and feedlot cattle older than 4 months and poultry. Not to exceed 50% of diet.

FHB outbreaks are becoming more frequent in the region due to increased acreages of conservation tillage and corn. The fungus survives on corn and small grain residue and releases spores that can be disseminated locally and over long distances. Thus, it is important that this disease is not forgotten when it comes time to select varieties for the upcoming season. **The first step in FHB management starts with the selection of a good, moderately resistant variety.** The most important aspect of a moderately resistant variety is its ability to slow the production or accumulation of DON in grain. The difference in DON accumulation between susceptible and moderately resistant varieties can be striking (Table 2). DON accumulation does not correlate well with bleaching of heads, so fields may have elevated levels of DON without showing significant levels of bleaching. This is why selection of a moderately resistant variety should be based off of DON data and not severity or incidence data.

Table 2. Recent results of FHB nursery trials conducted at Virginia Tech and The University of Maryland

Virginia Tech 2013	
LINE	DON
AgriMAXX 413	1.84
AgriMAXX 415	1.88
AgriMAXX 427	3.6
AgriMAXX 434	3.16
AgriMAXX 438	3
AgriMAXX Exp 1340	1.8
ARS08-0047	1.96
Coker9835	5.96
Dyna-Gro 9042	2.24
Dyna-Gro 9171	2.36
Dyna-Gro 9223	2.64
Dyna-Gro 9343	4.56
Featherstone VA258	2.76
Jamestown	1.76
Massey	2.76
MD04W249-11-7	2.96
Mercer Brand 11-V-25	9.12
Mercer Brand 12-V-25	2.6
Mercer Brand 12-W-27	6.88
Mercer Brand 12-W-29	4.6
Merl	3.44
MH07-7474	1.32
NC08-140	9.24
NC08-21273	5
NC09-22402	2.96
NC-Cape Fear	5.12
NC-Yadkin	5.28
Oakes	2.76
Pioneer 25R32	1.36
Pioneer 26R10	1.92
Pioneer 26R12	4
Pioneer 26R20	2.96
Pioneer 26R22	0.4
Pioneer 26R46	0.64
Pioneer Brand 25R40	6.16
Pioneer Brand XW11G	2.76
Pioneer 26R41	2.88
Pioneer 26R53	2.68
Shirley	4.28
Shirley Replaced	7.2
SS 520	6.8
SS 5205	5.4
SS 8302	2.88
SS 8340	2.6
SS 8350	3.2
SS 8404	2.12
SS 8500	2.12
SS 8700	6.72
Steyer Heilman	6.92
Steyer Hunker	2.16
Steyer Pierson	3.56
SY 483	0.12
SY Harrison	2.96
USG 3013	2
USG 3120	1.28
USG 3201	2.52
USG 3251	2.84
USG 3404	0.88
USG 3438	1.8
USG 3523	0.28
USG 3555	6.16
USG 3993	5.36
Average DON	3.71

University of MD 2012	
Line	DON
12V51	1
B050154	20
BRANSON	10
Chesapeake	8
Dyna-Gro 9012	8
Dyna-Gro 9171	12
FS 621	5
FS 888	3
FSX 815	8
FSX 820	16
FSX 825	13
FSX 830	8
FSX 835	16
GHT-933	9
Jamestown	4
MAS#10	16
MAS#14	11
MAS#2	19
MAS#20	5
MAS#21	5
MAS#22	7
MAS#23	14
MAS#24	9
MAS#25	8
MAS#4	11
MAS#7	7
Merl	7
OAKES	4
Pioneer 25R32	5
Pioneer 25R34	9
Pioneer 25R39	16
Pioneer 25R40	8
Shirley	13
SS 520	7
SS 5205	3
SS 560	8
SS 8302	11
SS 8340	9
SS 8404	4
SS 8500	7
SS Exp 8350	13
SS MPV57	10
SW53	6
SY1526	12
USG 3201	14
USG 3244	8
USG 3315	6
USG 3555	5
USG 3612	6
USG 3665	7
USG 3770	3
VA 258	12
W1566	17
WBX700	15
Average DON	9

University of MD 2013	
Line	DON
Dyna-Gro 9223	12.3
FS 888	8.3
FSX 815	3.9
FSX 820	8.2
FSX 870	5.0
MAS #2	7.0
MAS #23	9.6
MAS #26	8.5
MAS #4	5.4
MAS #6	8.1
MAS #7	10.5
Oakes	6.8
Pioneer 25R32	4.5
Pioneer 25R40	19.8
Pioneer 25R77	4.8
Pioneer 26R41	10.3
Shirley	14.6
SS 8340	12.7
SS 8404	8.7
SS 8500	19.6
SS EXP 412	16.9
SY 1526	19.4
SY 483	24.4
SY Harrison	10.3
USG 3201	7.9
USG 3251	12.2
USG 3315	10.7
USG 3404	7.7
USG 3523	14.3
USG 3555	14.3
USG 3612	8.1
USG 3770	7.5
USG 3993	14.3
Yorktown	11.2
Average DON	11.3

Percent Control DON vs Overall Average
>75%
>50%
>25%
>10
0

These trials use a misting system that reduces disease escapes due to timing of flowering. Varieties are color coded to indicate their DON reduction potential relative to the average DON in a given trial. Dark green = >75% control; light green = >50% control; yellow >25% control; orange = >10% control; red = no control or DON greater than the average. Data courtesy of Carl Griffey, Virginia Tech and Jose Costa, USDA-ARS (Formerly U. Maryland).

When the environment is favorable for FHB, combining a moderately resistant variety with a recommended fungicide application within 5-6 days of the start of flowering can result in roughly 75% reduction in DON relative to untreated susceptible varieties. Fungicide use alone on average suppresses DON by roughly 45%. The tables below provide the most recent DON data for FHB wheat nurseries managed by the University of Maryland and Virginia Tech. DON levels are not absolute, and due to the nature of the resistance there is some variability in the amount of DON suppression from year to year or field to field (Table 2). However, research indicates that moderately resistant varieties provide consistent reductions in FHB and DON. In addition, newer varieties yield well in the absence of disease and varieties continue to be released.

Announcements

Soybean Diagnostic Day

Tuesday, August 12, 2014 4:30 – 6:30 p.m.
University of Delaware
Research and Education Center
(old office building)
16686 County Seat Hwy
Georgetown, DE

Diagnostic Day is designed to help growers feel more comfortable diagnosing soybean production problems. The event will last about two hours and will consist of in-field, hands-on training to detect and identify pests and diseases of soybeans, and will end with a dinner courtesy of the soybean checkoff. There will be a number of educational materials provided that will be valuable resources for you to take home.

The United Soybean Board and Delaware Soybean Board are teaming up with the University of Delaware to sponsor the Soybean Diagnostic DayDiagnostic Day is supported by USB's Technology Transfer program.

Pesticide and CCA recertification credits have been requested.

To register contact Karen Adams at (302) 856-7303 ext 540 or adams@udel.edu.

UD Extension Vegetable & Fruit Program Open House

Thursday, August 21, 2014 4:00 – 8:00 p.m.
Carvel Research and Education Center
16483 County Seat Highway
Georgetown, DE 19947

Come see and hear about many of the UD Extension Vegetable and Fruit Program's field research projects from the 2014 season.

Watermelons: seedless variety trial, pollenizers growth regulators, compost, irrigation, root stocks, hollow heart.

Sweet Corn: Processing corn nitrogen, tillage trials.

Lima Beans: tillage, stress mitigation, rhizobium inoculants, regrowth cropping, variety evaluation and breeding for pole, Fordhook and baby lima types will be discussed

Pickles: parthenocarpic and gynoecious variety trials.

Other: onion variety trials, zucchini variety trials

Fruit: blueberries, grapes, blackberries

We will also have graduate students on hand to discuss their research in these areas: *Phytophthora capsici* in lima beans, root knot nematodes in lima beans, and watermelon fruit set

Dinner featuring local produce will be served.

Sponsored by the Fruit and Vegetable Growers Association of Delaware.

Please pre-register by August 15 by contacting Karen Adams at 302-856-2585 ext. 540 or adams@udel.edu.

University of Delaware Irrigation Field Day

Wednesday, August 20, 2014 10:00 a.m..
University of Delaware
Warrington Irrigation Research Farm
Corners of Rt 5 and DE 290 Cool Spring Rd/Hurdle Ditch Rd.
4 miles south of Harbeson, DE
signs will be posted

The University of Delaware Irrigation Program invites farmers, industry and the general public to tour UD's Warrington Irrigation Research Farm. UD Personnel will be sharing their latest irrigation research findings:

• Irrigated corn, wheat full season and double crop soybean irrigation research plots

• Experiences with subsurface drip irrigation for agronomic crops (SDI)

• Soil moisture monitoring as a tool to refine irrigation management

• Variable rate center pivot irrigation (VRI)

For more information contact: Karen Adams at 302-856-2585 ext. 540

Research Sponsored by: DNREC, Delaware Soybean Board, MD Grain Producers, NRCS and Vincent Farms

Delaware Agricultural Financing Workshop "Show Me the Money"

Wednesday, August 20 5:00 p.m.-8:00 p.m.
Harrington Firehall
20 Clark St.
Harrington, DE 19952

The Environmental Finance Center (EFC) invites Delaware farmers to a FREE event to discover information and resources to fund effective agricultural best management practices that can improve water quality while also offering benefits to your operation.

The agenda can be previewed here. Two Nutrient Management credits will be available for attendees.

Free dinner will also be provided.

There is no cost to attend, but pre-registration is requested, and will open in July. Please register by August 14th at http://events.r20.constantcontact.com/register/event?oeidk=a07e9c5i6rof26dff2a&llr=bhiq8ucab

Walk-in's (no registration) will be accommodated as seating is available.

Please contact us with any questions:
Jill Jefferson
Environmental Finance Center
jilljeff@umd.edu
540-325-0151

2014 Maryland Crop Insurance Workshop

Tuesday, September 9, 2014
Doubletree Hotel
210 Holiday Ct
Annapolis, Maryland

AGENDA

8:45
Registration and Coffee

9:15
Welcome

9:30
Current MD Crop Conditions and Outlook
Pat McMillan
Assistant Secretary, Marketing, Animal Industries, & Consumer Services

10:00
Farm Safety Net Under the 2014 Farm Bill
Dr. Joe Glauber
Chief Economist, U.S. Department of Agriculture

11:00
Current Crop Insurance & Federal Policy Situation
Stephen Frerichs
Lobbyist, American Society of Farm Managers and Rural Appraisers

12:00
Lunch

1:15
Update on 2014-15 Educational and Promotion Program
Howard Leathers,
Associate Professor Agricultural and Resource Economics, University of Maryland
Steve Connelly
Maryland Dept. of Agriculture
Lucas Clifton,
Farmers First Services

2:15
TBA
Juan Garcia
Administrator, Farm Service Agency, USDA

2:30
Assembling the Pieces into a Reliable Risk Management Plan
Gene Gantz
Risk Management Agency

3:15
Adjourn

This workshop is sponsored by the University of Maryland Department of Agricultural and Resource Economics, Maryland Department of Agriculture, USDA's Risk Management Agency, University of Maryland Extension and the Delaware Department of Agriculture. The workshop is free. To register please go to https://cropinsuranceworkshop.eventbrite.com .

Association of Specialty Cut Flower Growers Conference: "Growing Growers"

October 19-22, 2014
Hilton Wilmington/Christiana
100 Continental Drive
Newark, DE 19713

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http://www.ascfg.org/images/stories/growinggrowers.pdf

Additional conference information at:
http://www.ascfg.org/index.php?option=com_content&task=view&id=503&Itemid=1014

Weather Summary

Carvel Research and Education Center Georgetown, DE

Week of July 31 to August 6, 2014

Readings Taken from Midnight to Midnight

Rainfall:

0.18 inch: August 1
1.35 inch: August 2
1.60 inch: August 3
0.01 inch: August 5

Air Temperature:

Highs ranged from 86°F on August 5 to 73°F on August 2.

Lows ranged from 67°F on August 3 to 56°F on July 31.

Soil Temperature:

76.4°F average

Additional Delaware weather data is available at http://www.deos.udel.edu/monthly_retrieval.html and http://www.rec.udel.edu/TopLevel/Weather.htm

Weekly Crop Update is compiled and edited by Emmalea Ernest, Associate Scientist – Vegetable Crops