

Introduction to Cucurbit Diseases and Control

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IPGA SPRING MEETING 2019

What is IPM?

- **Scouting**
 - What part of the plant is affected
- **Identification**
 - Know your disease's
- **Treatment Options**
 - Chemical, cultural, biological, natural

What is IPM?

The use of **cultural**, **biological**, and **chemical** tactics to reduce a pest population below an acceptable **threshold**

- **Cultural** – non-chemical tactics
- **Biological** – arthropods eating other arthropods
- **Chemical** – pesticides, selection and spray timing

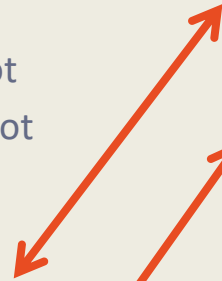
Pumpkin Pests

- Key Diseases:

- Powdery mildew
- Bacterial wilt
- Phytophthora
- Fusarium
- Plectosporium
- Angular leaf spot
- Bacterial leaf spot
- Anthracnose
- Downy mildew
- Yellow vine decline
- Virus (WMV), others

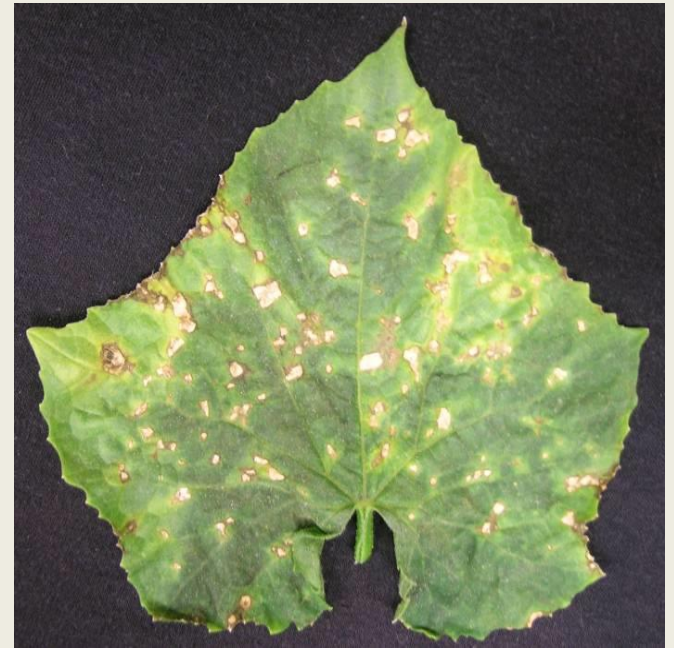
- Key Insects:

- Striped cucumber beetles/larvae
- Corn rootworm beetles/larvae(W, S, N)
- Squash bug
- Squash vine borer
- Aphids



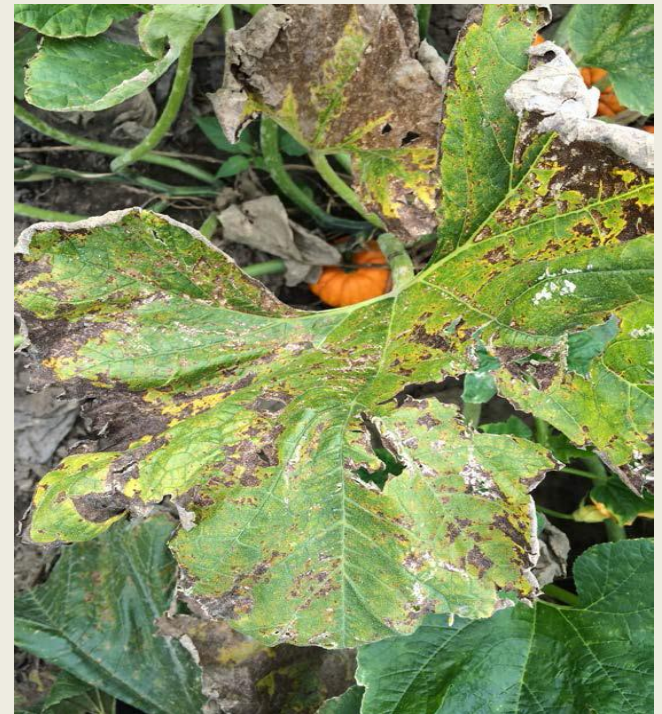
Angular Leaf Spot

- ALS can drip from leaves onto fruit, cause lesions to form on fruit, eventually lose fruit
- Prefers cooler temperatures
- Seed borne
- Survival in soil on plant debris



Bacterial Leaf Spot

- BLS can drip from leaves onto fruit, cause lesions to form on fruit, eventually lose fruit
- Prefers warmer rainy conditions
- Seedborne



Powdery Mildew

- Spores blow into the Midwest from the South
- Usually mid July
- Free Moisture, dew
 - Not saturation from rains, rain washes spores away



Powdery Mildew Program

- Start at first sign of colonies on leaves
- Spray every 7-10 days
- Alternate Procure and Quintec
- Every other spray add in Bravo or Manzate Pro Stick
- Additional products that are very good on PM
 - Luna Experience, Merivon, Torino, Nova, Rally

Powdery Mildew Program

- Need to make sure alternating chemistries, resistance has been confirmed in Ohio to group 1 and 11 fungicides
- OSU trials have shown reduced effectiveness of Quintec
- Use the highest labeled rate
- Adjuvants can be added but are generally not needed
 - Non ionic surfactant (NIS), if an adjuvant is desired
- Check FRAC numbers

Downy Mildew

- Favors mild (70's-low 80's), wet weather
- High Humidity, prolonged leaf wetness from dew, or rains
- Lack of treatment may result in total foliage loss in 7-10 days
- Does not over winter in Midwest



Phytophthora

- Can affect all parts of the plant and fruit
- Spreads rapidly under wet or water logged soil conditions
- Prefers warm temperatures
 - Heavy rains in July and August



Downy Mildew and Phytophthora

- Most labels and resources will say to wait until first signs of infection before applying a fungicide.
- The issue with that method is both of these diseases can spread and take down whole plants or multiple plants within days.
- Yes you can stop them! But its very difficult.
- Be proactive
 - Pay attention to the weather, not just the highs and lows for the day.
 - % humidity
- Know your patch
 - Drainage – best defense
 - Previous disease history

Downy Mildew and Phytophthora

- Elumin – New product for 2019 FRAC 22
- Presidio – FRAC 43
- Orondis Opti – FRAC M5, U15
- Orondis Ultra – New - FRAC 40, U15
- Zampro – FRAC 40, 45
- Ranman – FRAC 21
- Orondis Gold – FRAC 4, 49
- Ridomil Gold – FRAC 4

Gummy Stem Blight



- Can affect any growth stage
- Prefers mild temperatures (up to 75) and high humidity
- Resistance in the Midwest to group 11 fungicides (strobilurins)
- Fungicide
 - Luna Experience

What disease does this pest vector?



Bacterial Wilt



Not Seedborne

What insect is this?

What disease does it vector?



Yellow Vine Decline

- Bacteria vectored by squash bugs to plants, early to mid season
- Symptoms –yellow plants- appear 30+ days after infection
 - Starts at a vine tip and works back towards main vine
- Scout seedlings early, treat with foliar insecticides if > 1 egg mass / plant found
- **No cure, once symptoms develop pull plant**

FRAC Number

Group

7

11

Fungicide

Supplemental Label

merivon[®]
XEMIU[®] BRAND FUNGICIDE

For disease control and plant health in the following crops: bulb vegetables, cucurbit vegetables, leafy vegetables, root vegetables, strawberries, and tree nuts

This supplemental label expires on September 30, 2016 and must not be used or distributed after this date.

Powered by Xemium[®] and F500[®] fungicides

Active Ingredients:

fluxapyroxad*: 1 <i>H</i> -Pyrazole-4-carboxamide, 3-(difluoromethyl)-1-methyl-N-(3',4',5'-trifluoro[1,1'-biphenyl]-2-yl)-	21.26%
pyraclostrobin**: (carbamic acid, [2-[[[1-(4-chlorophenyl)-1 <i>H</i> -pyrazol-3-yl]oxy]methyl]phenyl]methoxy-, methyl ester)	21.26%

Other Ingredients:	57.48%
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Total:	100.00%
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* Equivalent to 2.09 pounds of fluxapyroxad per gallon

** Equivalent to 2.09 pounds of pyraclostrobin per gallon

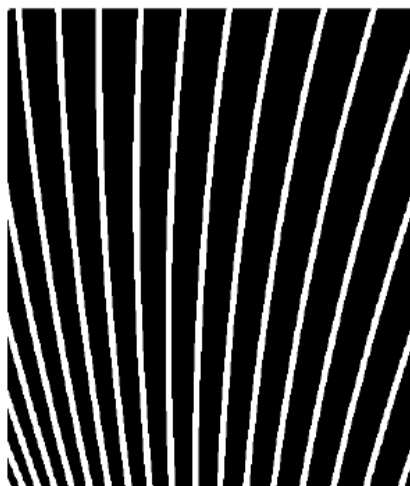
FRAC Number

GROUP

3

FUNGICIDE

Procure[®] 480SC



Agricultural Fungicide

Net
Contents:

Active Ingredient: (% by weight)

Triflumizole [1-[1-((4-chloro-2-(trifluoromethyl) phenyl) imino)-2-propoxyethyl]-1H-imidazole].....42.14%

Other Ingredients:57.86%

Total:.....100.00%

Contains 4 lbs. triflumizole per gallon.

KEEP OUT OF REACH OF CHILDREN
CAUTION

FRAC Number

GROUP M5 FUNGICIDE



PULL HERE TO OPEN ►



Bravo
WeatherStik®

syngenta.

Agricultural Fungicide

Active Ingredient:

Chlorothalonil (tetrachloroisophthalonitrile) 54.0%

Other Ingredients:

46.0%

Total:

100.0%

Bravo Weather Stik is formulated as a suspension concentrate (SC).

Contains 6.0 pounds chlorothalonil per gallon
(720 grams per liter)

KEEP OUT OF REACH OF CHILDREN.
CAUTION

See additional precautionary statements and directions for use
inside booklet.

EPA Reg. No. 50534-188-100

My Spray Program in 2014

Date	Product	Fung/Insect	FRAC	Rate	2 gal mix rate
6/15	Warrior II	Insecticide	3	1.92 oz/ac	5.68 ml
6/24	Warrior II	Insecticide	3	1.92 oz/ac	5.68 ml
	Bravo	Fungicide	5M	2 pts/ac	94.63 ml
7/6	Warrior II	Insecticide	3	1.92 oz/ac	5.68 ml
	Nova	Fungicide	3	5 oz/ac	14.17 g
7/13	Warrior II	Insecticide	3	1.92 oz/ac	5.68 ml
	Merivon	Fungicide	7&11	5.5 oz/ac	16.31 ml
7/20	Nova	Fungicide	3	5 oz/ac	14.17 g
7/27	Warrior II	Insecticide	3	1.92 oz/ac	5.68 ml
	Quintec	Fungicide	13	6 oz/ac	17.74 ml
	Bravo	Fungicide	5M	2 pts/ac	94.63 ml
8/3	Warrior II	Insecticide	3	1.92 oz/ac	5.68 ml
	Merivon	Fungicide	7&11	5.5 oz/ac	16.31 ml
8/10	Hero	Insecticide		10.3 oz/ac	30.52 ml
	Quadris	Fungicide	11	15.5 oz/ac	45.86 ml
8/17	Hero	Insecticide		10.3 oz/ac	30.52 ml
	Nova	Fungicide	3	5 oz/ac	14.17 g
8/24	Endigo ZC	Insecticide	3a & 4a	4.5 oz/ac	13.3 ml
8/31	Endigo ZC	Insecticide	3a & 4a	4.5 oz/ac	13.3 ml
	Quintec	Fungicide	13	6 oz/ac	17.74 ml
9/7	Endigo ZC	Insecticide	3a & 4a	4.5 oz/ac	13.3 ml
	Merivon	Fungicide	7&11	5.5 oz/ac	16.31 ml
9/14	Endigo ZC	Insecticide	3a & 4a	4.5 oz/ac	13.3 ml
	Bravo	Fungicide	5M	2 pts/ac	94.63 ml
9/21	Nova	Fungicide	3	5 oz/ac	14.17 g

My Spray Program in 2018

Date	Insecticide	Fungicide	Biological
5/30	Endigo ZC 13.5ml/2gal		Companion - 1oz/gal
6/10	Hero 30.5ml/2gal		Companion - 1oz/gal
6/13	Hero 30.5ml/2gal	Presidio 12ml/2gal	
6/23	Hero 30.5ml/2gal	Orondis 6ml/2gal, Merivon 16.3ml/2gal	
7/8	Endigo ZC 13.5ml/2gal	Procure 24ml/2gal, Luna Sensation 22.5ml/2gal	Companion - 3/4oz/gal
7/19	Endigo ZC 13.5ml/2gal	Presidio 12ml/2gal, Procure 24ml/2gal	
7/30	Hero 30.5ml/2gal	Acropolis 70ml/2gal	Companion 3/4oz/gal
8/9	Hero 30.5ml/2gal	Quintec 18ml/2gal, Bravo 95ml/2gal, Presidio 12ml/2gal	Companion 3/4oz/gal
8/11	Endigo ZC 13.5ml/2gal		Essential 3/4oz/gal
8/13	Endigo ZC 13.5ml/2gal	Presidio 12ml/2gal, Procure 24ml/2gal	
8/31	Endigo ZC 13.5ml/2gal	Presidio 12ml/2gal, Procure 24ml/2gal	

Protectant Fungicides

- **Sulfur** OK for fungal disease control, contact only
- **Potassium bicarbonate** OK for fungal disease control, contact only
- **Copper** OK for bacterial control, contact only
- **Chlorothalonil** OK for fungal disease control, contact only
 - Great tank-mix partner

Products To Consider

- At plant – Admire - Soil applied systemic insecticide
- Foliar Insecticides – Sevin, Warrior II, Hero, Endigo ZC – really good on aphids
 - Endigo ZC – Warrior plus thiamethoxam (Foliar applied systemic)

Products To Consider

- Broad Spectrum – Bravo, Merivon, Luna Experience, Quadris, Cabrio, Pristine
- Powdery mildew specific – Nova, Quintec, Procure, Manzate Pro Stick
- Downy Mildew and Phytophthora
 - Orondis Opti/Ultra or Gold, Presidio, Ranman, Elumin
- ROTATE FRAC NUMBERS!!!!

2095 plant on
8/22





Questions

Sources and Useful Links

Detailed information of FRAC numbers, what they mean and a complete list of pesticides associated with each number

- http://ipm.ifas.ufl.edu/resources/success_stories/T&PGuide/pdfs/Appendices/Appendix6-FRAC.pdf

Sally Miller OSU Vegetable Pathology Lab

- <https://u.osu.edu/vegetablepathologylab/>

Pesticide labels

- <http://www.cdms.net/labelsmsds/lmdefault.aspx?ms=1>

<https://u.osu.edu/jasinski.4/pumpkins/>

2019 Midwest Vegetable Guide, has specific section for cucurbits with up to date pesticide lists for each major disease

- <https://ag.purdue.edu/btny/midwest-vegetable-guide/Documents/2019/ID-56-W%202019.pdf>

OSU Vegetable disease news/blog

- <http://u.osu.edu/miller.769/>

Growing Pumpkins in Green Acres presentation by Jim Jasinski

- <https://edis.ifas.ufl.edu/pp280>

Detailed information on IRAC numbers

- <https://www.irac-online.org/>