

NC COOPERATIVE EXTENSION

Red Headed Flea Beetle Update

Danny Lauderdale
Area Specialized Agent, Commercial
Ornamental Nursery and Greenhouse
-Eastern Region-

NC COOPERATIVE EXTENSION

Red Headed Flea Beetle

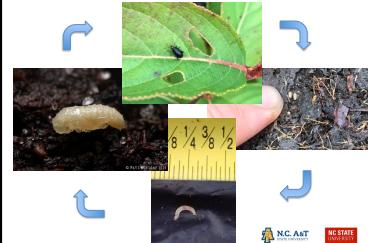
- Systema frontalis*
 - TX-FL
 - ME-MT
 - Atlantic
 - SE
 - Cranberries
 - Blueberries
 - NE
 - PNW



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Life Cycle



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Ornamental Hosts



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Other Ornamental Hosts

• <i>Cornus ammonum</i>	• Cephalanthus
• <i>Calicarpa dichotoma</i>	• Aucuba
• <i>Physocarpus</i> sp.	• Sarcococca
• Joe-pye weed	• Coreopsis
• Chrysanthemum	• Veronica
• Black-eyed Susan	• Zinnia
• Salvia	• Distylium
• Asters	• Lespedeza
• Azalea	• Dahlia
• Sedum	

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Weed Hosts

• Lambsquarter
• Pigweed
• Smartweed
• Foxtail
• Dogbane
• Velvetleaf
• Canadian thistle
• Jewelweed
• Red/white clover
• Ragweed
• Beggarticks

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Crop Hosts

- Cranberries
- Soybeans
- Corn
- Cabbage
- Beans
- Beets
- Potatoes
- Blueberries
- Clover
- Grapes

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Current Adult Insecticides

Active Ingredient	Ex-Trade Name	REI (hr)	IRAC MOA Group
acephate	Orthene	12	1A
acetamiprid	Tristar	12	4A
bifenthrin	Onyx, Talstar	12	3
carbaryl	Sevin	12	3
chlorpyrifos	DuraGuard ME	24	1B
cyantraniliprol	Mainspring	4	2B
cyfluthrin + imidacloprid	Discus NG	12	3 + 4A
diazinon	Diazinon AG500	12	1B
dinotefuran	Safari 20SG	12	4A
fluvalinate	Mavrik Aquaflow	12	3A
imidacloprid	Merit, Marathon II	12	4A
lambda-cyhalothrin	Scimitar GC	24	3A
spinetoram + sulfoxaflor	Xppire	12	4C + 5
spinosad	Conserve SC	4	5
thiamethoxam	Flagship 25WG	12	4A

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Timing/GDD₅₀

Growing Degree Data for WILSON, NC (27893)

Date	Temp: High/Low	Daily GDD 60F	YTD GDD 60F
2/11/18	54°F / 37°F	2.5	2.5
2/12/18	58°F / 37°F	4.0	4.0
2/13/18	53°F / 37°F	0	37.5
2/14/18	49°F / 37°F	0	37.5
2/15/18	58°F / 42°F	0	37.5
2/16/18	62°F / 42°F	0	32.5
2/17/18	51°F / 37°F	0	32.5
2/18/18	44°F / 37°F	0	32.5
2/19/18	49°F / 21°F	0	32.5
2/20/18	57°F / 28°F	0	32.5
2/21/18	63°F / 32°F	0	32.5

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Online Phenology and Degree Day Models

Output from www.ncaces.org/degree-day-model-calculator-web-program

Main values from daily weather data

CALCULATOR INPUTS

Calculator method: **Avg. JJA** Mean daily temperature
Setting upper threshold to: **130 F** default
Default start date: **1/1/2017** current date
Default end date: **12/31** default date
No setting date, set to: **12/31**

CALCULATOR OUTPUTS

Model: **DD50** (151.00 DD50) Location: **NC Lat:35.4121 Long:-78.3405 elev:444**

on day max min precip GDD50 CumGDD50 events

Day	Max Temp	Min Temp	Precip	GDD ₅₀	Cum GDD ₅₀	Events
1	31.00	42.00	0.00	0.00	0.00	
2	32.00	43.00	0.00	1.00	1.00	
3	33.00	44.00	0.00	2.50	4.5	
4	34.00	45.00	0.00	3.00	7.5	
5	35.00	46.00	0.00	3.00	9.5	
6	36.00	47.00	0.00	3.00	12.5	
7	37.00	48.00	0.00	3.00	15.5	
8	37.00	49.00	0.00	3.00	18.5	
9	37.00	50.00	0.00	3.00	21.5	
10	36.00	51.00	0.27	0.00	9.5	
11	35.00	52.00	0.00	1.00	10.5	
12	32.00	55.00	0.00	13.50	24.5	
13	30.00	57.00	0.00	14.50	39.0	
14	31.00	46.00	0.00	0.00	39.5	
15	32.00	47.00	0.00	1.00	40.5	
16	33.00	48.00	0.00	1.00	41.5	
17	34.00	49.00	0.00	1.00	42.5	
18	32.00	43.00	0.00	7.50	51.5	
19	30.00	41.00	0.00	6.50	58.0	
20	28.00	40.00	0.01	4.50	62.5	

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Timing/GDD₅₀

- Growing Degree Days at second generation larva detection:
 - 240-480 GDD₅₀ in MD (Brian Kunkel, U. of Delaware)
 - 300-460 GDD₅₀ in NC (2017, Danny Lauderdale)
- Growing Degree Days at first generation adult detection:
 - 517-785 GDD₅₀ in MD (Brian Kunkel, U. of Delaware)
 - 526-720 (900) GDD₅₀ in NC (2017, Danny Lauderdale)

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Timing/GDD₅₀

- Growing Degree Days at second generation larva detection:
 - 1570-1860 GDD₅₀ in MD (Brian Kunkel, U. of Delaware)
 - 2200-2300 GDD₅₀ in NC (2017, Danny Lauderdale)

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Timing/GDD₅₀

- Growing Degree Days at second generation adult detection:
 - 2100-2240 GDD₅₀ in MD (Brian Kunkel, U. of Delaware)
 - ~2700-2900 GDD₅₀ in NC (2017, Danny Lauderdale)

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Brian Kunkel Trial Summary

- Beauveria bassiana* (BioCeres® WP, BotaniGard® 22WP and Naturals® L)
- Metarhizium anisopliae* (Met52® EC)
- Steinernema carpocapsae* (Millenium® and Nematac®)
 - Provided 75-99% control of larvae in lab and nursery--
- dinotefuran* (Safari® 20SC)
- imidacloprid* (Discus® Tablets)
- thiamethoxam* (Flagship® 25WG)
- cyantraniliprole* (Mainspring®)
- azadirachtin* (Azatin® O, AzaGuard®, Ornatin®, and Molt-X®)
- bifenthrin* (Bifen, Talstar®)
 - Significantly reduced populations of larvae--

NC COOPERATIVE EXTENSION

Brian Kunkel Trial Summary

- Beauveria bassiana* (BioCeres® WP, BotaniGard® 22WP and Naturals® L)
- Metarhizium anisopliae* (Met52® EC)
- dinotefuran* (Safari® 20SC)
 - Applied as larvae drench reduced foliar damage--
- imidacloprid* (Discus® Tablets)
- thiamethoxam* (Flagship®), foliar spray
- cyantraniliprole* (Mainspring®), foliar spray
- bifenthrin* (Bifen, Talstar®), foliar spray
- lambda-cyhalothrin* (Scimitar® GC), foliar spray
 - Significantly reduced leaf damage--

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2017 Trials and Observations

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Predator Observation (3/9/17)

Stratiolaelaps scissurae (Womelsdorf)
25,000 LITER
(formerly called Hypomecus scissurae)

Feeds on nymphs, adults, and other small soil organisms.
Distribute at center into soil or surface of plants.
DO NOT OVERAPPLY. Maximum 25,000 predators/liter in one liter of peat carrier. Distribute carrier around the root zone of plants at a rate of 100 ml per 10' CROP/FI UNTS.

HOLD AT ROOM TEMPERATURE
www.appliedbio-nomics.com for detailed use and applications.

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Predator Observation (3/9/17)

NC COOPERATIVE EXTENSION Predator Observation (6/5/17)

- Average number of damaged leaves per plant (5 random plants)
 - *Dalotia coriaria* (Rove beetle) = 7
 - *Stratiolaelaps scimitus* (Predatory mite) = 16

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NC COOPERATIVE EXTENSION Predator Observation (3/17/17)

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NC COOPERATIVE EXTENSION Predator Observation (5/17/17)

- Average number of damaged leaves per plant

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NC COOPERATIVE EXTENSION Predator Observation (5/17/17)

- Average number of damaged leaves per plant (10 plants per treatment group)
 - UTC = 17
 - Tent UTC = 51
 - Tent Dc = 19
 - Tent Sc = 35
 - Tent Dc + Ss = 23

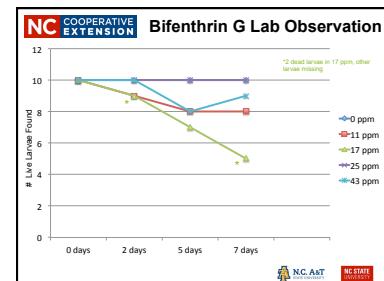
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NC COOPERATIVE EXTENSION Bifenthrin G Lab Observation

- Collected potting substrate mix from 4 nurseries
- Calculated bifenthrin ppm based on rate and bulk density

Bifenthrin PPM	0 ppm	11 ppm	17 ppm	25 ppm	43 ppm
# Live Larvae Found	10	9	7	8	9

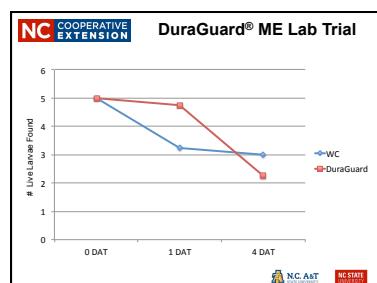
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NC COOPERATIVE EXTENSION DuraGuard® ME Lab Trial

- Collected larvae by non-destructive nursery sampling
 - Rate 50 fl oz/100 gallon
 - 16.5 ml drench volume

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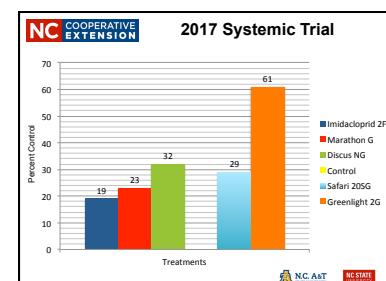
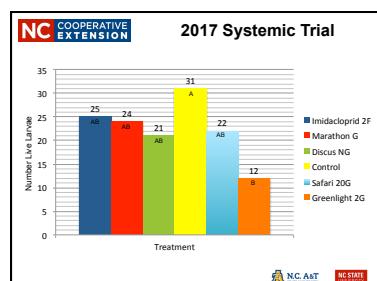
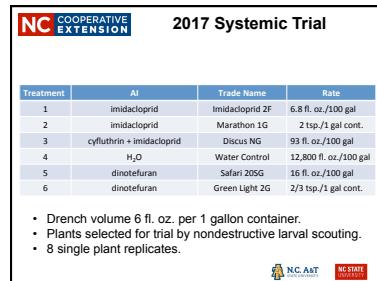
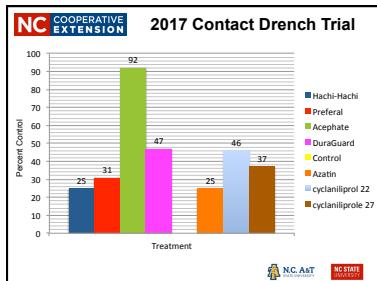
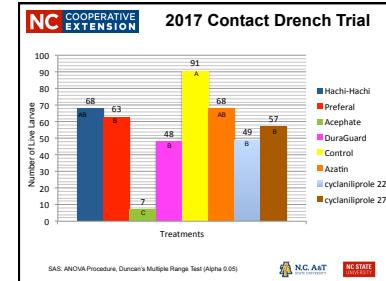


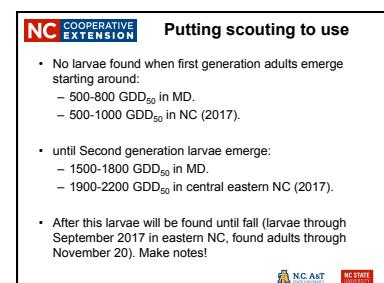
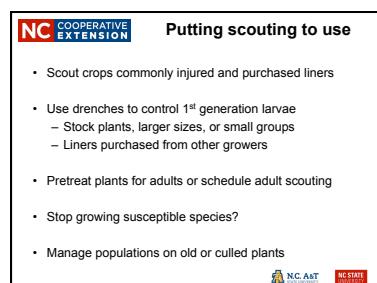
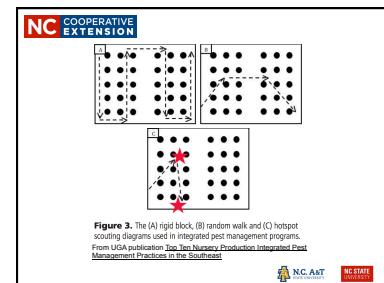
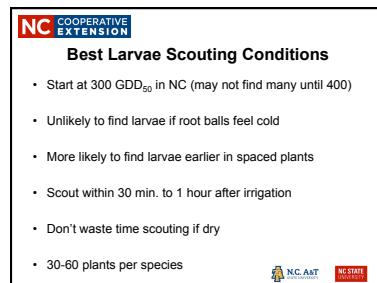
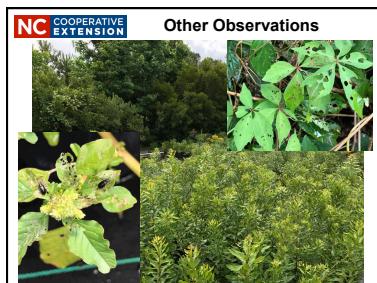
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Treatment	AI	Trade Name	Rate
1	tolfenpyrad	Hachi-Hachi® SC	16 fl. oz./100 gal
2	<i>Isaria fumosorosea</i> Apopka Strain 97	Preferal®	2 lb. oz./100 gal
3	acephate	Acephate® 97UP	12 oz./100 gal
4	chlorpyrifos	DuraGuard® ME	50 fl. oz./100 gal
5	H_2O	Irrigation Water (C)	12,800 fl. oz./100 gal
6	azadirachtin	Azatin® O	16 fl. oz./100 gal
7	cyclaniliprole	22 fl. oz./100 gal	
8	cyclaniliprole	27 fl. oz./100 gal	

- Drench volume 12 fl. oz. per 3 gallon container.
- Plants selected for trial by nondestructive larval scouting.
- 10 single plant replicates.

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What's Next?

- More larvae and adult scouting
- Pretreatment systemic trial
- Post larvae hatch drench trial
- Granular incorporation trial
- Continue GDD monitoring
- Flight interception
- Sweep netting
- Soil emergence traps
- Lab trials and observations



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Thank you!

- Applied Bionomics
- BASF
- Bayer
- Carolina Seasons
- Fair View
- Gardens Alive Farms
- Greenleaf
- Great Gardens
- Green Biz
- Harrell's
- Jericho Farms
- NCNLA
- NuFarm
- OHP
- Sampson Nursery
- SePRO
- Smith's Nursery
- Syngenta
- Tinga Nursery
- Triangle CC

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