



Pecan Pesticides—a seasonal perspective

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IPM is the Pillar of Modern Commercial Agriculture

- United Nations [Food and Agriculture Organization](#) defines IPM as:
- “The careful consideration of all available pest control techniques and subsequent integration of appropriate measures that discourage the development of pest populations and keep pesticides and other interventions to levels that are economically justified and reduce or minimize risks to human health and the environment.”
- “IPM emphasizes the growth of a healthy crop with the least possible disruption to agro-ecosystems and encourages natural pest control mechanisms.”

“IPM” tends to mean insect control, but control of diseases and orchard floor vegetation cannot be compartmentalized away from this discussion.

Organic or Natural? What's the difference?

INGREDIENT/PROCESSING	ORGANIC	NATURAL	CONVENTIONAL
Artificial flavors	NEVER	No	May be used
Artificial colors	NEVER	No	May be used
Artificial preservatives	NEVER	No	May be used
Artificial fertilizers	NEVER	May be used	May be used
Artificial pesticides	NEVER	May be used	May be used



Earth-Kind®





**WITHOUT PESTICIDES, IN SOME
CASES WE DON'T HAVE EFFECTIVE
SOLUTIONS**



We live in a transitional world where our toolbox of pesticides can be a mix of old chemistry and new, synthetic, natural, microbial, Omri-approved and not.....

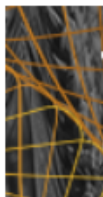
The mandate of the land grant system is to be unbiased and research-based.

Images and listing of tradename products is not intended to imply exclusive endorsement. Where chemical formulas are sold as generics—any tradename product of the same active ingredient and formulation is implied to be similarly effective.

This presentation is in no way meant to be comprehensive, but to make the viewer aware of when in the growing season certain types of pesticides will be needed.



What do you need to have in your toolbox?



Previsto™
Gowan Company
10163-330

Propaz
Sharda USA LLC
83529-49

PropiMax® EC Fungicide
Corteva Agriscience United States
62719-346

PureSpray™ Green
Petro-Canada
69526-9

Quash® Fungicide
Valent U.S.A. LLC Agricultural Products
59639-147

Rampart® Fungicide
Loveland Products, Inc.
34704-924

ReCon™ Bold SL
Atticus Ag
91234-219

Regev®
Summit Agro USA, LLC
86182-5-88783

Pristine® fungicide
BASF Ag Products
7969-199

Propicure 3.6F
WinField United
83222-18

Propi-Star® EC
Albaugh, LLC Agricultural Products
42750-211

PureSpray™ Spray Oil 10E
Petro-Canada
69526-5

Quash® SC Fungicide
Valent U.S.A. LLC Agricultural Products
59639-227

Reckoning Fungicide
GroPro Corporation
EXEMPT

Regalia®
Pro Farm Group, Inc
84059-3

Reliant® Systemic Fungicide
Quest Products LLC
83416-1

Procon-Z™ Fungicide
Loveland Products, Inc.
34704-879

Propiczone Fungicide
LG Life Sciences
83529-22-91026

Protocol®
Loveland Products, Inc.
34704-1064

Quadris Top®
Syngenta Crop Protection, LLC
100-1313

Quilt Xcel®
Syngenta Crop Protection, LLC
100-1324

ReCon™ 4 F
Atticus Ag
91234-64

Regalia® CG
Pro Farm Group, Inc
84059-3

Resist 57™
Actagro, LLC
82940-1

PDF

1 / 20



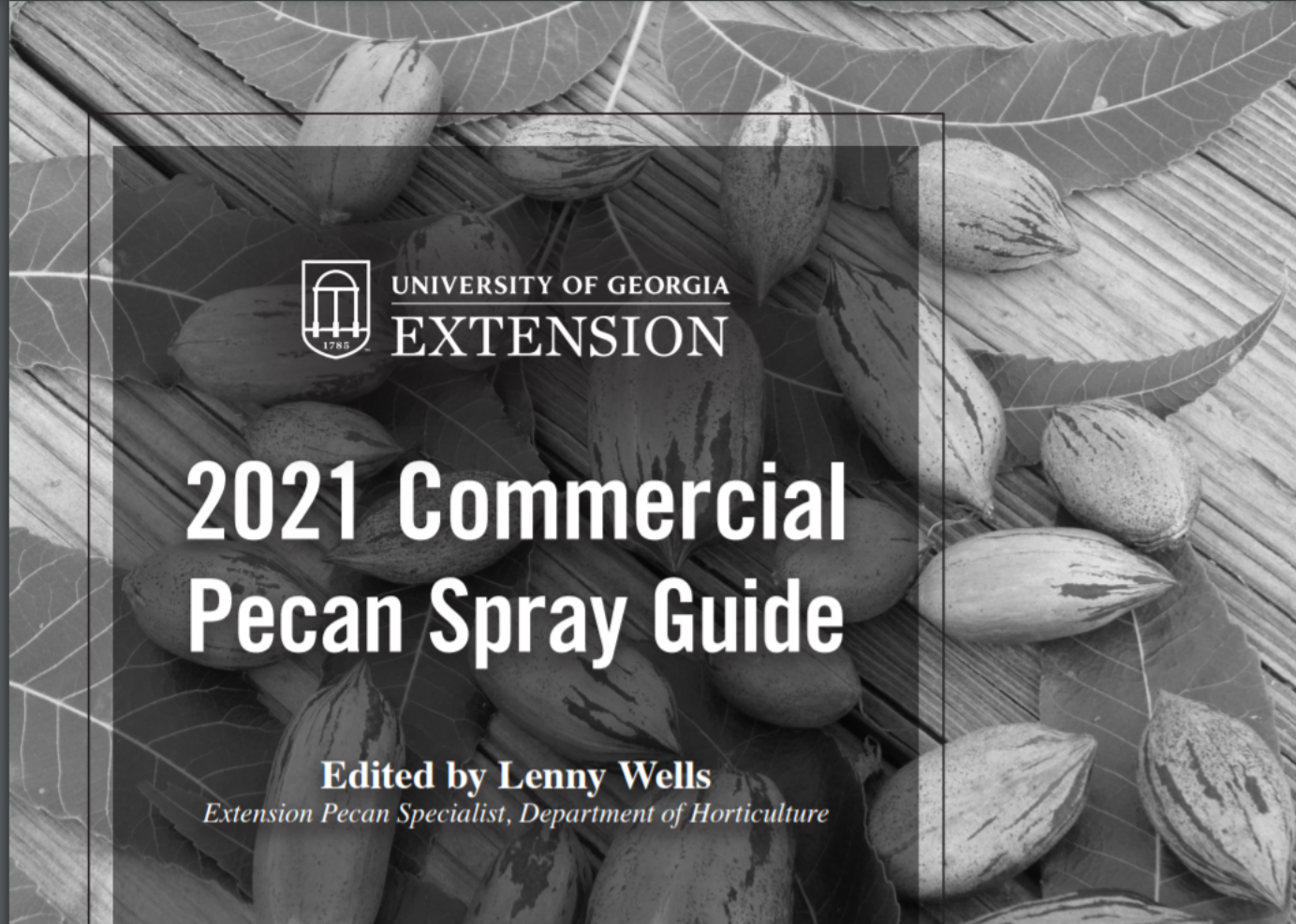
75%



1

2

3



UNIVERSITY OF GEORGIA
EXTENSION

2021 Commercial Pecan Spray Guide

Edited by **Lenny Wells**
Extension Pecan Specialist, Department of Horticulture



Figure
pecan
Un
Bugwo



12.29.2004

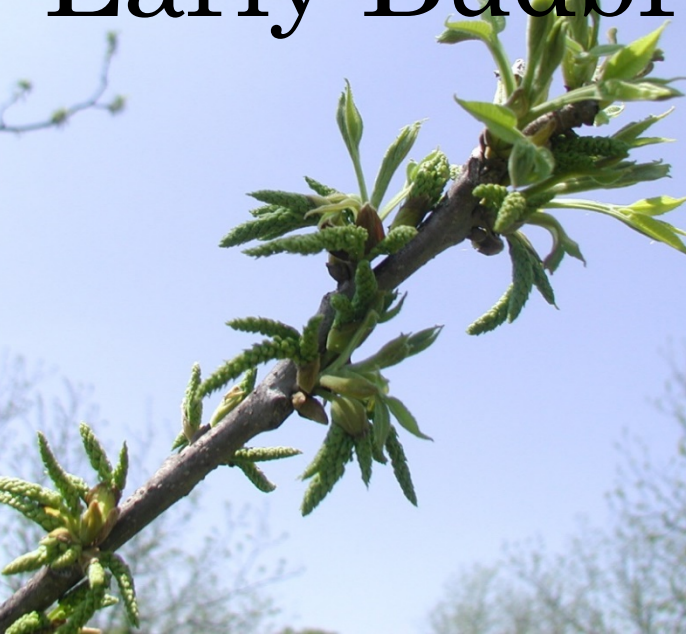
Pecan South Magazine

Dormancy---Nothing needed, right?



Density of the oil, i.e., distillation temperature influences efficacy. Thorough coverage required to control scale insects on limbs in the dormant season. Can be phytotoxic during the growing season.

Early Budbreak-March/April



Pecan phylloxera



Acetamidprid GROUP 4A INSECTICIDE

ASSAIL® 70WP

INSECTICIDE

For Agricultural Use Only

ACTIVE INGREDIENT:	By Wt.
Acetamidprid, (E)- N ¹ -[(6-chloro-3-pyridyl)methyl]-N ¹ -cyano-N ¹ -methyl acetamidine	70.0%
OTHER INGREDIENTS:	30.0%
TOTAL:	100.0%

EPA Reg. No. 8033-23-70506

Specimen Label



NATURALYTE® INSECT CONTROL

®Trademark of The Dow Chemical Company ("Dow") or an affiliated company of Dow

A Naturalyte® insect control product formulated for control of lepidopterous larvae (worms or caterpillars), leafminers, thrips, and red imported fire ants.

Group	5	INSECTICIDE
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Active Ingredient:

spinosad (a mixture of spinosyn A and spinosyn D)	80%
Other Ingredients	20%
Total	100%

Contains 80% active ingredient on a weight basis.



Honorable Mention: Pecan Budmoth

Modes of Action

The IRAC Mode Of Action (MoA) Classification is the *definitive* global authority on the target site of insecticides. It is the basis of MoA labelling of insecticides worldwide and is an essential tool for the development of insecticide resistance management (IRM) strategies. For more information please visit the [MoA Team](#) page, and should you wish you are welcome to [submit an active](#) for classification by the [IRAC MoA Team](#).

The colour scheme below associates mode of action into broad categories based on the physiological functions affected, as an aid to understanding symptomatology, speed of action and other properties of the insecticides, and not for any resistance management purpose. Rotations for resistance management should be based only on the numbered mode of action groups.

■ Nerve & Muscle
 ■ Growth
 ■ Respiration
 ■ Midgut
 ■ Unknown or Non-Specific

1 ACETYLCHOLINESTERASE (ACHE) INHIBITORS

- A CARBAMATES ▼
- B ORGANOPHOSPHATES ▼

2 GABA-GATED CHLORIDE CHANNEL BLOCKERS

- A CYCLODIENE ORGANOCHLORINES ▼
- B PHENYLPYRAZOLES (FIPROLES) ▼

3 SODIUM CHANNEL MODULATORS

- A PYRETHROIDS, PYRETHRINS ▼
- B DDT, METHOXYCHLOR ▲

DDT, Methoxychlor

4 NICOTINIC ACETYLCHOLINE RECEPTOR (NACHR) COMPETITIVE MODULATORS

- A NEONICOTINOIDS ▼
- B NICOTINE ▼
- C SULFOXIMINES ▼
- D BUTENOLIDES ▼

5 NICOTINIC ACETYLCHOLINE RECEPTOR (NACHR) ALLOSTERIC MODULATORS

- SPINOSYNS ▲

Spinetoram, Spinosad

6 GLUTAMATE-GATED CHLORIDE CHANNEL (GLUCL) ALLOSTERIC MODULATORS

- AVERMECTINS, MILBEMYCINS ▼

7 JUVENILE HORMONE MIMICS

8 MISCELLANEOUS NON-SPECIFIC (MULTI-SITE)



Miravis Top

DIFENOCONAZOLE	GROUP 3	FUNGICIDE
PYDIFLUMETOFEN	GROUP 7	FUNGICIDE

PULL HERE TO OPEN

Fungicide

ADEPIDYN® Technology*

Active Ingredients:

Pydiflumetofen**:	6.9%
Difenoconazole***:	11.5%

Other Ingredients:	81.6%
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Total:	100.0%
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*Technology denotes the active ingredient Pydiflumetofen

**CAS No. 1228284-64-7

***CAS No. 119446-68-3

Miravis® Top is formulated as a suspension concentrate and contains 0.63 lb of pydiflumetofen and 1.04 lb difenoconazole per gallon.

KEEP OUT OF REACH OF CHILDREN.

CAUTION

See additional precautionary statements and directions for use inside booklet. See First Aid Statement inside booklet and on container label.

EPA Reg. No. 100-1602

EPA Est. 100-NE-001

SCP 1602A-L1B 1020

4135543

2.5 gallons

Net Contents



Miravis Prime

PYDIFLUMETOFEN	GROUP 7	FUNGICIDE
FLUDIOXONIL	GROUP 12	FUNGICIDE

PULL HERE TO OPEN

ADEPIDYN® technology*

Fungicide

ADEPIDYN® Technology*

Active Ingredients:

Pydiflumetofen**:	12.8%
Fludioxonil***:	21.4%

Other Ingredients:	65.8%
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Total:	100.0%
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*Technology denotes the active ingredient Pydiflumetofen

**CAS No. 1228284-64-7

***CAS No. 131341-86-1

Miravis® Prime is formulated as a suspension concentrate and contains 1.25 lb of pydiflumetofen and 2.09 lb fludioxonil per gallon.

KEEP OUT OF REACH OF CHILDREN.

CAUTION

See additional precautionary statements and directions for use inside booklet. See First Aid Statement inside booklet and on container label.

EPA Reg. No. 100-1603

EPA Est. 100-NE-001

SCP 1603A-L3D 1020

4131022

**1 gal 6 fl oz
(134 fl oz)**

Budbreak to Pre-Pollination Disease Concerns—March/April



Scab



Leaf Dieback



Fungicide Groups, Names, Usage

FRAC GROUP #	Group	Best Use	Resistance				
3	 <p>BASF We create chemistry</p>	<table border="1"> <tr> <td>Mefentrifluconazole</td> <td>Group</td> <td>3</td> <td>Fungicide</td> </tr> </table>	Mefentrifluconazole	Group	3	Fungicide	
Mefentrifluconazole	Group	3	Fungicide				
11	SPECIMEN						
1	 <p>Cevya[®] Fungicide</p>		High				
30	<p>† For disease control in berries, bulb vegetables, cucurbit vegetables, fruiting vegetables, grapes, leafy vegetables, pome fruits, root vegetables, stone fruits, strawberry, and tree nuts</p> <p>† See Detailed Use Directions for detailed crop listings.</p> <p>Active Ingredient*: mefentrifluconazole: 2-[4-(4-chlorophenoxy)-2-(trifluoromethyl)phenyl]-1-(1H-1,2,4-triazole-1-yl)propan-2-ol 34.93%</p> <p>Other Ingredients: 65.07%</p> <p>Total: 100.00%</p> <p>*Cevya[®] fungicide contains 3.34 lbs mefentrifluconazole per gallon.</p>			te			
12				te			
33							
7	Succinate dehydrogenase inhibitor: Miravis	Tank Mix	Very High				

Efficacy Trials-TAMU Pecan Orchard

LifeGard[®]WG

BIOLOGICAL PLANT ACTIVATOR

To Reduce Occurrence and Severity of Plant Disease on Listed Crops Grown Outdoors or in Greenhouses, Shadehouses, or Other Cover



CAN BE USED IN ORGANIC PRODUCTION



ACTIVE INGREDIENT:

Bacillus mycoides isolate J* 40.0%

OTHER INGREDIENTS: 60.0%

TOTAL 100.0%

* Equivalent to a minimum of 30 billion (3×10¹⁰) viable spores/g of product.

**KEEP OUT OF REACH OF CHILDREN
CAUTION**

Sil-MATRIX[®] LC

FUNGICIDE/MITICIDE/INSECTICIDE

For use on vegetables, fruits, nuts, vine crops, field crops, ornamentals and turf for control of fungal diseases, and control of spider mites, aphids and whiteflies.



CAN BE USED IN ORGANIC PRODUCTION



ACTIVE INGREDIENT:

Potassium silicate29%

OTHER INGREDIENTS:71%

TOTAL:100%

**KEEP OUT OF REACH OF CHILDREN
CAUTION**

Refer to inside of label booklet for additional precautionary information and Directions for Use.

Early May—South Texas



Pecan Nut Casebearer: A threat to destroy entire pecan crops in May

PNC Control Options

Specimen Label



Dow AgroSciences



NATURAL

®Trademark of The Dow Chemical Company, a
company of Dow

A **Naturalyte**® insecticide for control of
of lepidopterous larvae, thrips, and red imp

Group

Active Ingredient:
spinosad (a mixture of spinosad and spinosyn D) ...
Other Ingredients.....
Total
Contains 80% active ingredient



WITH THE ACTIVE INGREDIENT RYNAXYPYR®

CHLORANTRANILIPROLE GROUP 28 INSECTICIDE



ed companies

INSECTICIDE

VANTACOR™ insect control is a suspension concentrate. SHAKE WELL BEFORE USING

Contains 5.0 lb. active ingredient per gallon.

Active Ingredient

By Weight

Chlorantraniliprole 3-Bromo-N-[4-chloro-2-methyl-6-[(methylamino)carbonyl]phenyl]-1-(3-chloro-2-pyridinyl)-1H-pyrazole-5-carboxamide	47.85%
Other Ingredients	52.15%
TOTAL	100.0%

..... 28.30%
..... 5.66%
..... 66.04%
..... 100.00%
am per gallon

Mid May to Late July

Leaf & Shoot Growth



Nut Sizing





Yellow aphid complex



Black Pecan Aphids



Scorch
Mites

Product knowledge becomes important!

Lepidopterans	Scab	Aphids- Yellow & Black	Mites	Stinkbugs	Grasshoppers
Selective or Non-Selective Insecticide	Fungicide	Selective or Non-Selective Insecticide	Miticide or Non-Selective Insecticide	Non-Selective Insecticide	Selective or Non-Selective Insecticide
Same as PNC- Group 5, 18, 28	Lots of options	Group 4A, 4C, 4D High resistance risk	Group 3A Group 21 A Nexter	Group 3A,3	Group 3A,3
Bt—Biological WC & Fall Webworm	Group-U12 (dodine) Group 30 (TPTH)	Group 9B, 21, 29	Group 6 Abamectin		Group 28
		Non-selective- Group 3A, 3	Group 10 B Zeal		
			Sulfur- Microthiol Disperss		

Fungicide efficacy differs between leaf and nut scab

DODINE GROUP U12 FUNGICIDE

ELAST[®] 400 FLOWABLE FUNGICIDE

FOR CONTROL OF CERTAIN DISEASES OF PEANUTS* AND PECANS*.

*NOT REGISTERED FOR USE IN CALIFORNIA.

ACTIVE INGREDIENT:	% BY WT.
Dodine (n-dodecylguanidine acetate)	39.6%**
OTHER INGREDIENTS:	60.4%
TOTAL:	100.0%

**Equivalent to 3.4 pounds Dodine per gallon

EPA Reg. No. 70506-611

RESTRICTED USE PESTICIDE

RESTRICTED USE PESTICIDE due to carcinogenicity, potential for affecting fetal development, and high acute toxicity to humans. For retail sales to and use by Certified Applicators or persons directly under their supervision, and only for those uses covered by the Certified Applicators Certification.

Super Tin[®] 4L

Triphenyltin Hydroxide Flowable Fungicide

ACTIVE INGREDIENT	By Weight
Triphenyltin Hydroxide	40.0%
OTHER INGREDIENTS	60.0%
TOTAL	100.0%

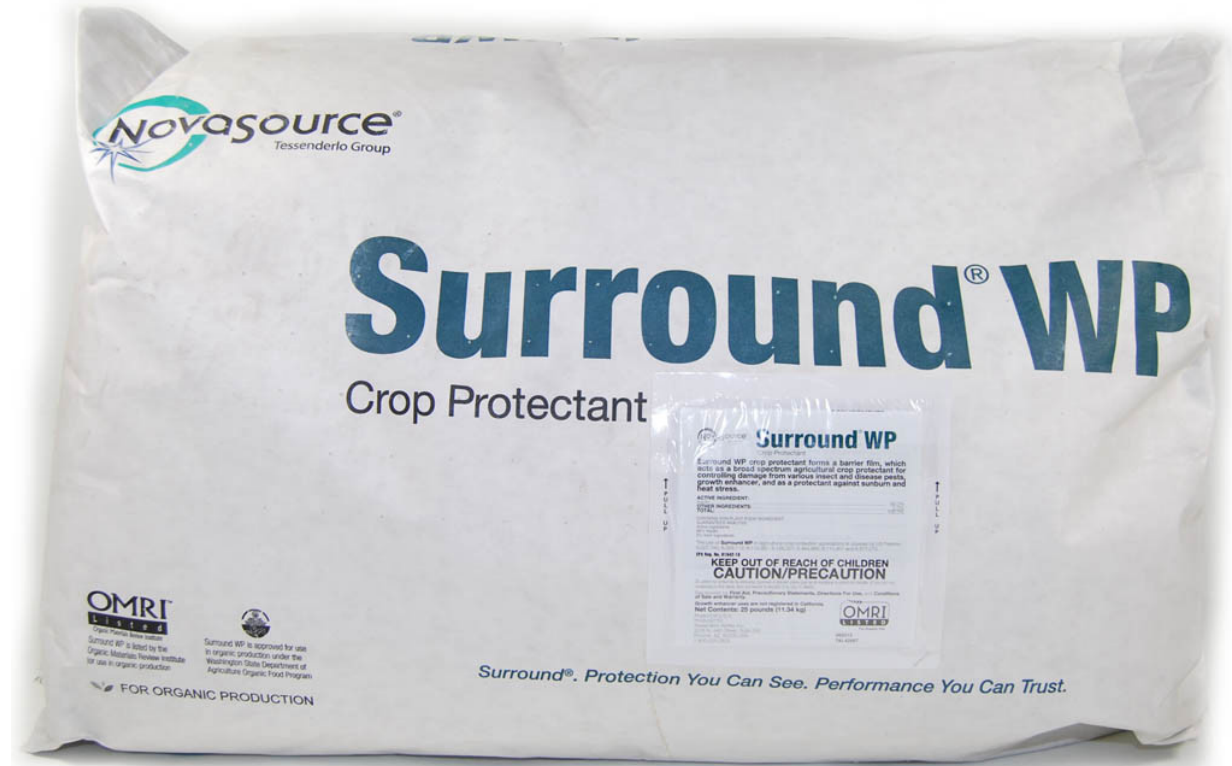
Contains 4 Pounds Triphenyltin Hydroxide Per Gallon

KEEP OUT OF REACH OF CHILDREN
DANGER PELIGRO



Alternative products need more efficacy data

- Kaolinite clay
- Coating on plant alters light refraction, temperature, on treated crops, including pecans (Lombardini et al, 2005).
- No physiological advantage
- No effect on PNC, yellow aphids, beneficial insects.
- Effects on stinkbugs, weevil ???



August

Shell Hardening



Hickory
Shuckworm



Stinkbugs



Pecan Weevil



Yellow aphid complex



Lepidopteran Insects-walnut caterpillar, 3rd Gen PNC, Fall Webworm



The most damaging period for Scab—nuts



Black Pecan Aphids



Scorch
Mites



Shell hardening means nuts are full size; no more growth or exposed tissue. Full size nuts that have been sprayed are fully protected.



August Pesticide Toolbox

Lepidoptera ns	Scab	Aphids- Yellow & Black	Mites	Stinkbugs	Weevils
Selective or Non-Selective Insecticide	Fungicide	Selective or Non-Selective Insecticide	Miticide or Non-Selective Insecticide	Non-Selective Insecticide	Selective or Non-Selective Insecticide
Same as PNC-Group 5, 18, 28	Group-U12 (dodine) Group 30 (TPTH)	Group 4A, 4C, 4D	Group 3A Group 21 A Nexter	Group 3A,3	Group 3A,3
Bt—WC & Fall Webworm		Group 9B, 21, 29	Group 6 Abamectin		Group 28
		Non- selective- Group 3A, 3	Group 10 B Zeal		Grandevo WDG

September-October

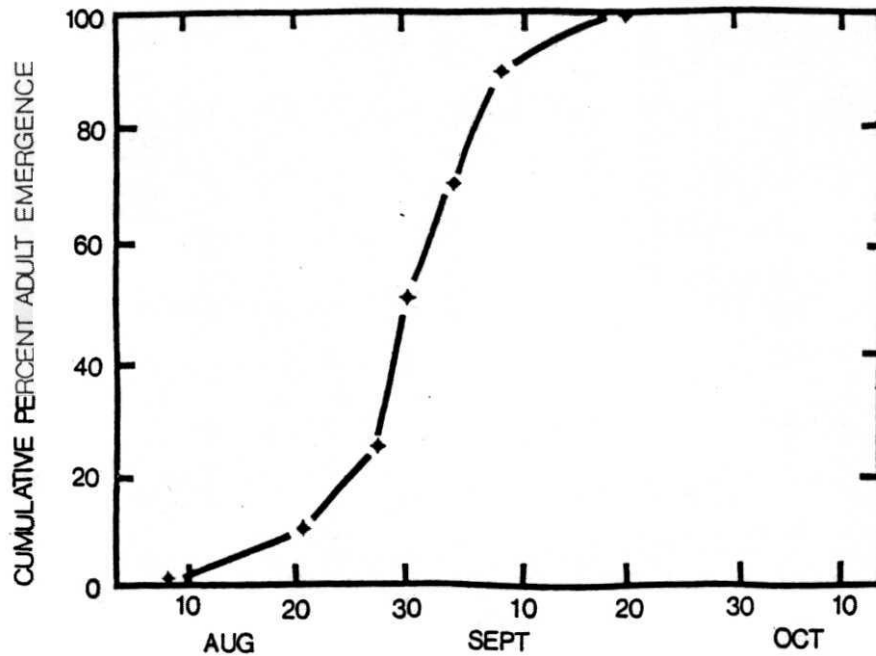
Shucksplit



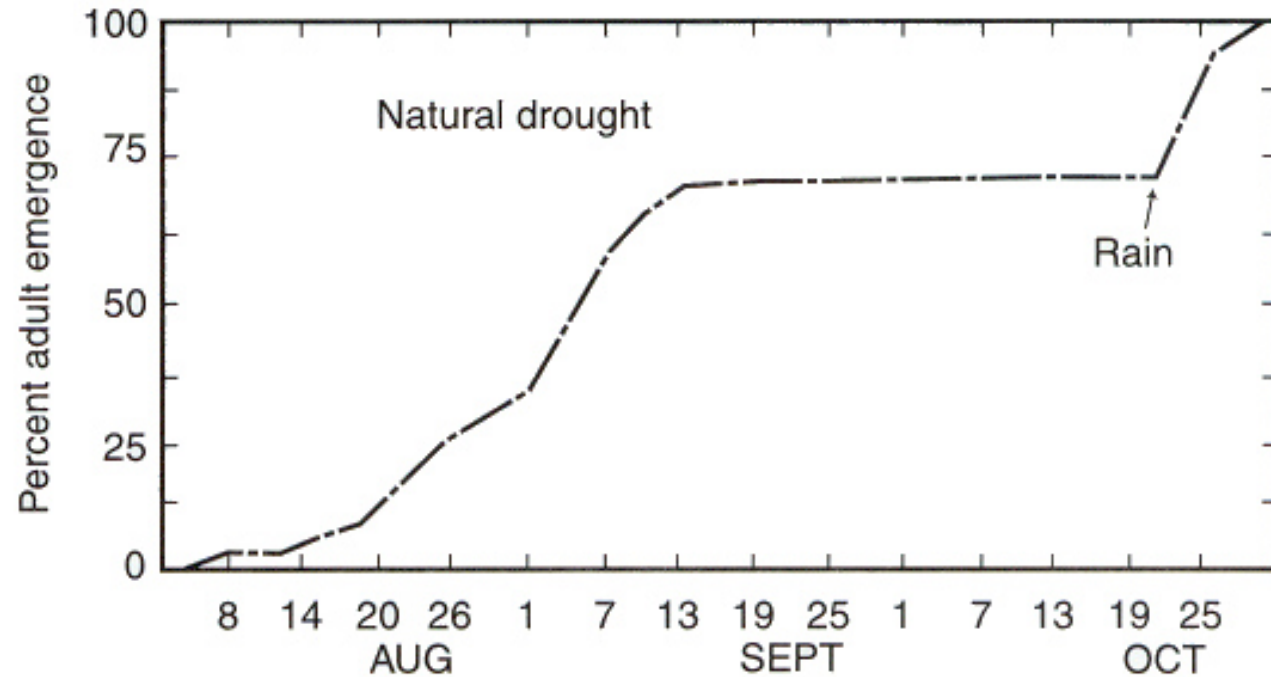
Hemipteran, Weevils, Mites,
Aphids

Weevil emergence is affected by late season rain

NORMAL ADULT EMERGENCE
80% Aug 20 – Sept 10



DROUGHT DELAYED ADULT EMERGENCE



GRANDEVO[®]
BIOINSECTICIDE WDG



Sevin[®] 
Carbaryl Insecticide



HICKORY SHUCKWORM



Damaging (reduced kernel percentage) to later nut maturity varieties.
Example--Forkert

Same song-third verse, no fungicides

Lepidopterans	Aphids- Yellow & Black	Mites	Stinkbugs	Weevils
Selective or Non- Selective Insecticide	Selective or Non- Selective Insecticide	Miticide or Non- Selective Insecticide	Non-Selective Insecticide	Selective or Non- Selective Insecticide
Same as PNC- Group 5, 18, 28	Group 4A, 4C, 4D	Group 3A Group 21 A Nexter	Group 3A,3	Group 3A,3
Bt—WC & Fall Webworm	Group 9B, 21, 29	Group 6 Abamectin		Group 28
		Group 10 B Zeal		Grandevo WDG
	Non-selective- Group 3A, 3	Sulfur- Microthiol Disperss		

Pesticide selection and use is expensive/ should come from the most informed position.

Consult all available resources, and most importantly-know the life cycles, weather influence and economic impact potential of all possible insects and diseases.....



OH, and there's more to making these decisions!