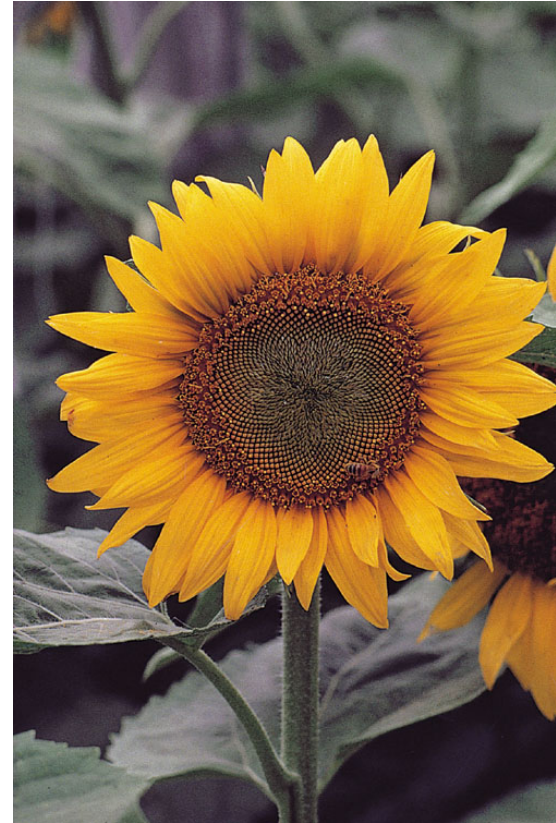




# **West Texas Sunflower Insects**



**Ed Bynum<sup>1</sup> and Calvin Trostle<sup>2</sup>**

**Texas A&M AgriLife Extension Service**

**<sup>1</sup>Extension Entomologist, Amarillo, TX (806) 677-5600,  
ebynum@ag.tamu.edu**

**<sup>2</sup>Extension Agronomist, Lubbock, TX (806) 746-6101,  
ctrostle@ag.tamu.edu**

# **Sunflower Production in Pictures**



- Some of the most important things you need to know about sunflower production in Texas

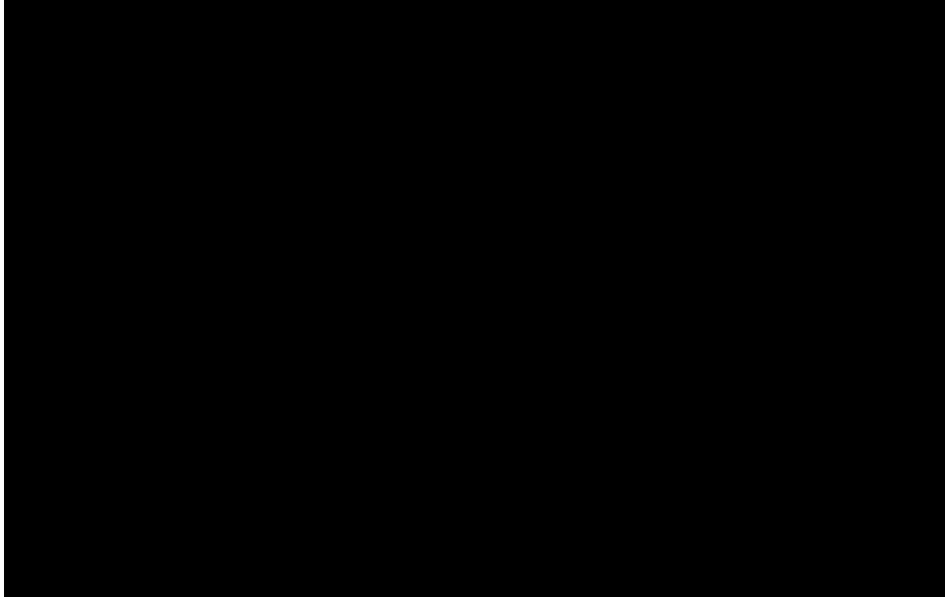
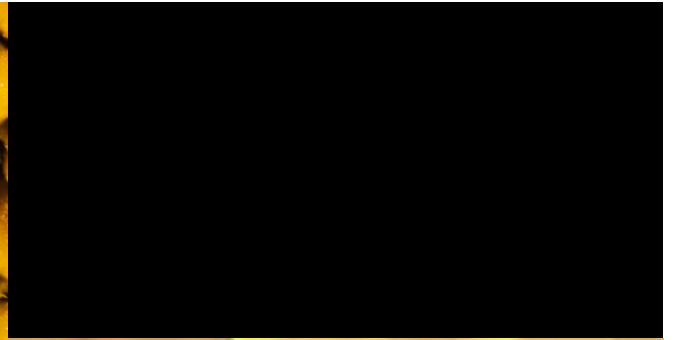
























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# And Ultimately *Rhizopus* Headrot



“Styrofoam  
Bricks!”



# Are these pictures worrisome?



- Don't let them be—just be informed
- The good news is that the sunflower moth is manageable—**We know:**
  - How to scout (if we don't just automatically spray, our apologies to IPM practices)
  - When to spray
  - What to use
  - To follow up to ensure the first spray is OK
- This just happens to be a major downfall of too many inexperienced, first time, or “a-couple-of-days-too-late” growers



# Easy Way to Ruin Sunflower

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- In our experience this is the #1 problem in Texas sunflower production
- Stated a different way, the most likely stumbling block that turns a decent crop into something sub-optimal, and in worst cases, a failure



## The “Boll Weevil of Sunflowers”—Sunflower Moth

Too many growers “**never knew**” about this insect before growing, or if they did they sprayed too late—It will lead to major crop damage if not controlled.

The moth you scout for—  
early dawn or nearly dark!

The larvae feeding which  
leads to fungal infection.





# Sunflower Moth



- Threat for 7-10 days beginning with initial bloom when pollen becomes available
  - Second spray when needed 5-7 days later (but not for low yields in dryland)
- Don't get caught!—Hybrids bloom fast, from 5% to 75% bloom in 2-3 days if warm
  - Don't wait until 2-5% bloom to contact your airplane; get on the spray schedule
- Uncontrolled larvae eventually burrow into head destroying seed--increasing susceptibility to *Rhizopus* head rot

# Rapid Progression of Bloom

Hybrid	Planted	--- % of Bloom ---		
		<u>8/13</u>	<u>8/15</u>	<u>8/17</u>
Triumph 845HO	6/26/07	0	5	68
Red River 2215	6/26/07	1	9	84
		<u>7/11</u>	<u>7/13</u>	<u>7/15</u>
Triumph 845HO	5/17/08	1	23	96
Red River 2215	5/17/08	0	10	74



# Example of Larval Abundance

	Mean Number of SFM Larvae/Head			
Days After 1st Bloom	Field 1	Field 2	Field 3	Field 4
3	0	2	1	0
6	3	0	3	9
9	7	27	2	77
12	38	15	4	220
15	34	28	3	263
18	28	18	3	312
21	13	24	7	215
24	8	23	47	142
27	4	12	71	77
30	---	12	75	---
33	---	13	---	---

# Sunflower Moth Spraying



- "Managing Insect Pests of Texas Sunflower," Texas AgriLife Extension Service, E-579 (2009)
  - <http://agrilibookstore.org> for view/print/download color copy
- Sunflower moth treatment strategies
  - Historical 'By the Book' suggestions
  - Current 'By the Book' suggestions
  - Industry recommendations & practices



# Sunflower Moth Spraying

## ■ Historically “By the Book” – 1998 Texas Guide

- Spray @ 20% - 25% bloom when any moths are found in the field – Count any head as blooming when any part of the flower is exposed.
- Apply first pyrethroid (possibly with methyl parathion for added quick knock down) @ 20-25% of plants in bloom
- Downside: Have to be scouting early, No room for error; practice tolerated significant level of moths in the field; moths have 1-2 days to freely lay eggs
- Result: Applications not timed right then producers are likely to have damage?

# Sunflower Moth Spraying

- Current “By the Book” (Extension’s insect guide)
  - Spray at 15-25% bloom ‘when moths are in the field’, Count any head as blooming when any of the ray flowers are opening and disk flowers are exposed.
  - No statement on how many moths (threshold is presence, not number)
  - Apply first pyrethroid (possibly with added methyl parathion for quick knock down)
  - Downside: Still no room for error; moths still have 1-2 days to freely lay eggs on many heads
  - Result: Still have potentially damage if late



# Sunflower Moth Spraying

## ■ Industry practices & recommendations #1

- Spraying earlier (~5% bloom, i.e. 1-2 days earlier) & lower moth threshold—this minimizes mistakes, may provide better results, allows room for delayed spraying
- Makes the spraying decision sooner (which allows more time to schedule spraying)
- Downside: Could you spray too early? If you spray this early, would you lack chemical residue in 5-7 days, or be forced to spray a second time (esp. dryland)?
- Result: No method is immune to failure, but industry widely believes this approach offers protection against common pitfalls (spraying too late, more time to act if it appears first spray was not effective), possible better control

# Sunflower Moth Spraying

## ■ Industry practices & recommendations #2

- Spraying earlier and automatically (~5% bloom, i.e. 1-2 days earlier)
- Makes the spraying decision sooner (which allows more time to schedule spraying)
- Downside: Again, could you spray too early, and lack chemical residue later? Did you in fact need to spray, especially for late-planted sunflower (thereby an unnecessary expense)? It is wise to still know what level of moth was in the field (might influence decision on whether to spray a second time)
- Result: No method is immune to failure, but at least you can't say you didn't spray.







# Sunflower Bloom Stages



Early R-4

Late R-4

R-5.1  
(10% of disk  
flowers in bloom)

R-5.2  
(20% of disk  
flowers in bloom)

Texas Agricultural Extension Service  
Calvin Trostle / Patrick Porter

Calvin Trostle/Pat Porter, Texas A&M AgriLife Extension Service



# Sunflower Moth Spraying & IPM

- Is it unthinkable to suggest we'd spray sunflower for sunflower moth without scouting
- However, industry experience suggests that as a group we might be better off if we sprayed automatically because of the mistakes that can occur
- It is commonly thought "If you have head damage it means you sprayed too late"
  - This discounts that truly sometimes a spray doesn't work
  - Or the moth flight was late

# **New Insecticide, New Approach—Prevathon, 2013 I.**



- Active ingredient, chlorantraniliprole (Rynaxypyr), from Dupont
- “Softer” chemical; does not affect honeybees and other beneficials
- See supplemental label for further information
- Ignore label’s minimum 2 gallons water per acre, go with at least 3 gpa, preferably 4



# **New Insecticide, New Approach—Prevathon, 2013 II.**



- “Translaminar” movement of insecticide to feeding larvae
  - Little to no activity on adults so scouting after your first spray doesn’t mean much
- 10 to 14-day spray interval (though supplemental label says 7 days, use MSO additive)
  - **Extension & Dupont agreement, December 2013:** initial spray of 14 oz./A at 1% bloom and then 14 oz./A again in 7-10 days (a single initial 20 oz./A application may not be enough)

# **New Insecticide, New Approach —Prevathon, 2013 III.**



- See the special label for Texas at <http://www.cdms.net>
- First spray earlier (initial bloom) than pyrethroid alone (5-20% bloom)
- Initial data compared to pyrethroid, which kills beneficials, demonstrates lower larval counts in the head for Prevathon
- First impression from Texas A&M AgriLife Extension entomologists: results are good, mixed thoughts on excluding pyrethroid until more data is collected
  - Besiege, from Syngenta, is a mix of Rynaypyr (different formulation) and pyrethroid

# New Insecticide, New Approach—Besiege, 2013



- Syngenta—mix of chlorantraniliprole and pyrethroid (Lambda-cyhalothrin), 6-10 oz/A
- See the special label for sunflower at <http://www.cdms.net>
- First spray “before pests reach damaging levels”
- Chlorotraniliprole in Prevathon: 10 oz./A rate of Prevathon = 7.6 oz/A for Besiege
  - A 14 oz./A rate of chlorotrniliprole would be 10.6 oz./A of Besiege, which is a little high
  - This rate of Besiege @ 7.6 oz./A includes 1.54 oz/A of Warrior II/L-cyhalothrin (labeled range for sunflower, 1.28-1.92 oz./A)



# **New Insecticide, New Approach—Belt (Bayer), 2013**



- First spray same time as pyrethroid
- Like Prevathon, this does not kill adults either, but kills young feeding larvae; does not have movement within the plant
- Ignore label's minimum 2 gallons water per acre, go with at least 3 gpa, preferably 4
- First impression from Texas A&M AgriLife Extension entomologists: results are good, mixed thoughts on excluding pyrethroid until more data is collected
  - Limited data suggests good control, reduction in feeding larvae

# Bottom Line—Sunflower Moth



## ■ Whatever approach you choose:

- 1) Do your best to achieve uniform emergence, hence uniform bloom
- 2) Two weeks prior to probable spray, get a commitment from applicator and make sure chemicals are on hand
- 3) Do scout at first bloom anywhere in the field (if you are a first-time grower, get help)
- 4) Aerial spray—minimum 3 gal/A, hopefully a little more
- 5) Follow-up scouting a from 3 - 4 days after first spray to ensure you get kill to know if moths are still present

# Frank Discussion on Sunflower Moth Spray Timing

- Personally, I think our AgriLife recommendations (for pyrethroids?) in and of themselves are OK, but you must scout early and be prepared to spray, if you are ready then YOU CAN GET IT DONE AT THE RIGHT TIME (THE NEXT DAY?) and get good control.
- But too many farmers don't take time to scout and spray in time
- Although this violates what we know and believe about Integrated Pest Management (IPM), collectively as a group, farmers would be better off if we just sprayed automatically even if only a few scattered moths are observed.
- Scouting during the heat of the day is not reliable for moth populations between few and moderate. They hide on the leaves rather than up on the heads as during pre-dawn and late dusk.



# Sunflower Moth Larval Damage



This is especially detrimental to confectionary.



Upper left, R-3, will soon reveal back side of ray petals (above, R-4), then with ray petals open the next day (left, R-5.1) will begin physiological bloom around the edge of the face.

This picture sequence is about 7-9 days.

# “Managing Insect Pests in Texas Sunflower,” Dr. Ed Bynum, Texas AgriLife Extension—Amarillo (2009)

Insect pests are often a major limiting factor in Texas sunflower production. Of the 30 insect species recorded on sunflower in Texas, about 15 are considered potentially major pests. The sunflower moth is the major common pest of sunflower. Stem weevils, seed weevils, the stalk girdlers, and thistle caterpillar are of secondary importance, although they can be quite serious when abundant.

Both oilseed and non-oilseed (confectionary) sunflowers are grown in Texas. The small, black seeds of oilseed sunflower contain 38 to 50 percent oil. They are processed into sunflower oil and also used as bird feed. Confectionary sunflower seeds are usually large with black and white stripes. They are used for human consumption in a variety of food products.

Because the sunflower has a relatively short growing season, it is suitable primarily as a spring-planted crop or as a second crop after wheat. Sunflower can be an alternative crop where plantings of other crops have been destroyed by wind, sand, rain or hail. Drought tolerance makes sunflower an attractive dryland crop and an alternative in areas with limited irrigation. Sunflower also responds well under full irrigation.

Cultural practices that help reduce insect problems include crop rotation, modified planting dates, weed control, volunteer and wild sunflower control and tillage. However, the judicious use of insecticides is often required for successful sunflower production in Texas. Producers should be able to identify the insect pests that reduce sunflower yield and know when those pests are most likely to occur during the growth of the plant. They should also understand pest biology and the control measures that are most effective.

## Insect pests infesting the head

### Sunflower moth

Lepidoptera: Pyralidae, *Homoesoma electellum* (Hulst)

The sunflower moth, also called the head moth, is the single most important sunflower pest in Texas. Sunflower moth infestations are usually heaviest early in the growing season, with another smaller moth flight possible later in the season. The adult is a small, slender, silver-to-buff gray moth about  $\frac{1}{2}$  inch long. It is most often seen resting on sunflower heads during the blooming period, especially in early morning and early evening.



Figure 1. Sunflower moths (photo by Scott Russell).



Figure 2. Sunflower moths (photo by Scott Russell).



# Other Insects in TX Sunflower



- Soybean stem borer in sunflower (*Dectes texanus Leconte*); adult is Longhorn beetle; also known as sunflower stem borer or sunflower stalk girdler
- Stem weevil

# Stem Borer (*D. texanus*)



- Occasional high incidence (e.g., 2001); often not noticed until plants lodge
- Egg laying near petioles, single larvae burrows in pith, often found late in season in base of plant
- Girdles plant at soil line from inside out; backfills bore hole with plant fibers, frass



Adult Long-horn beetle  
(*Dectes texanus*)









This is the soybean stem borer larvae, about  $\frac{3}{4}$ ", maybe 1" long that girdles the sunflower stalk from the inside out, leaving a neat cut or break. Rarely ever more than one per plant.

# Stem Borer (*D. texanus*)



- No pheromone traps, hard to scout, no control recommendations at this time
- Incidence appears higher near/after soybeans enough that we don't recommend soy after sunflower or vice versa
- Observations suggest lodging potential increases with higher plant populations
- Be ready to harvest



# Stem Weevil



- Diverse observations on this being a problem
  - National Sunflower Association annual surveys haven't shown much activity
  - Seed company production finds this to be a common problem
- Furadan no longer available for control
- Seed treatments are not effective
- SW larval rates drop significantly after mid June planting dates — (Carl Patrick, retired AgriLife Extension entomologist)

# Other Misc. Items



- Red/gray seed weevil?
- Banded sunflower moth?
- Many companies now treat all hybrids with CruiserMaxx; Bayer also uses a package of treatments (can't remember their insecticide)

# Seed Treatments



- Gaucho, Poncho, CruiserMaxx (which also includes fungicide)
- The latter two can add significant cost to seed
- Generally 45 days of protection is about the limit of expected protection
- ?Some protection from wireworms but not carrot beetle