



August 1, 2017

“It was the best of times, it was the worst of times.” - *Charles Dickens*

This seems to describe soybean weed control in 2017.

Like in the Dickens classic, it seems that while many growers achieved much in the battle with resistant weeds and have clean fields, many of their neighbors clearly struggled. What made the difference? Probably one or more of several factors.

Recipe for Failure

1. “Wing it” like many could do when glyphosate still killed everything.
2. Wait until corn is planted to focus on soybean weed control
3. Rely on total post programs , especially with single mode of action even if new
4. Cut rates to save money, weeds don’t care about the price of soybeans.
5. Use old nozzles that were good enough in the past, but are no longer.
6. Wait to terminate cover crops until the last minute and have chemistry hang up in the trash.
7. Fail to apply preemerg herbicides until weeds have already emerged
8. Spray post materials early on small weeds to avoid escapes and future resistance.

Recipe for Success

1. Know your weeds and make an effective plan.
2. Read herbicide labels and follow directions.
3. Fall or early spring applications for marestail or other winter annuals with residual + burndown capability
4. Use strong rates of strong residual chemistry which can overcome weak resistance
5. Utilize overlapping residual herbicides of different MOA to extend residual control past crop canopy.
6. Cultural practices like crop rotation or tillage to disrupt habitat for pigweeds or winter annuals.
7. Use higher spray solution volumes for maximum coverage. Water is cheap compared to chemistry
8. Utilize appropriate adjuvants

See the field below in eastern Missouri where failure apparently led to mowing the field down. Desperate measure indeed.



Bush-hogged Strips On South Side Middle Of Field Mowed Down Strips Of Waterhemp North

Inside This Issue

A Tale of Two Soybean Fields 2017

- Soybean weed control that worked, and some that didn’t pages 1 -3
- Soybean insect pests continue pages 4-5
- Kansas State Bioassay on soybean podworms 2016

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Soybean Weed Control - What worked?

- Authority[®] First DF herbicide 5oz. pre *MOA groups 14+ 2*
Followed by post emerge tank mix of
- Anthem[®] MAXX herbicide** 2.5oz. *groups 15+14*
- Roundup PowerMAX[®] herbicide 28 oz. *group 9*
- XtendiMax[®] herbicide 22 oz. *group 4*

**Anthem MAXX herbicide not yet on approved tank mix list for commercial applications of Xtendimax herbicide.

Planted 5/17
Pre application 5/18
Fb a few days of rain

Application of overlapping residual plus post emerge to small weeds 6/16

CAREFUL!! Note one row accidentally planted to non dicamba tolerant variety.

Check: waterhemp, palmer amaranth, velvetleaf, foxtails, morningglories

- *Overlapping residual treatments plus post*
- *3 effective sites of action on resistant pigweeds*



Kansas State University Ashland Bottoms 2017

The plot above illustrates key components of a resistant weed control strategy:

1. Cultural practice –tillage prior to application to remove emerged weeds
 2. Overlapping soil active herbicide application for extended residual control.
 3. Early application of post treatment to small weeds. Made easier by the pre application.
 4. Multiple applications and multiple effective modes of action.
- For 2018, in fields with a history of problems with pigweeds, a higher rate of residual herbicide, for Authority First DF herbicide, at least 6.4 oz., can help extend control especially if there is creeping resistance to PPO inhibiting (group 14) herbicides in the area. Using higher rates is a key component of resistance management



Soybean Weed Control - What worked?

Authority[®] Elite herbicide 32 oz. Pre MOA groups 14 +15

Followed by a post application:

Liberty[®] herbicide 29 oz.

MOA group 10

Planted 5/15

Pre application 5/18

Fb a few days of rain

Authority Elite herbicide is a premix of 2 effective MOA on resistant pigweeds & assists Liberty herbicide with excellent pre grass control.

Liberty herbicide applied post emerge to small weeds 2-4" Taking out the cocklebur that Authority Elite herbicide is weaker on than other Authority brand herbicides.

Check: waterhemp, cocklebur, sunflower, foxtails, morningglories

➤ *Pre followed by post that compliment each other*

➤ *3 effective sites of action on resistant pigweeds*



University Of Missouri . Bradford Farm 2017

The plot above illustrates choosing herbicides that compliment each other:

1. Authority Elite herbicide, strong on grass control as well as two effective MOA on resistant pigweeds
2. Followed by Liberty herbicide strong on both resistant pigweeds and other broadleaf weeds.
3. Early application of post treatment to small weeds. Made easier by the pre application.
4. Multiple applications and multiple effective modes of action.

Late Season Soybean Insect Management



21-Day PHI



28-Day PHI



21-Day PHI

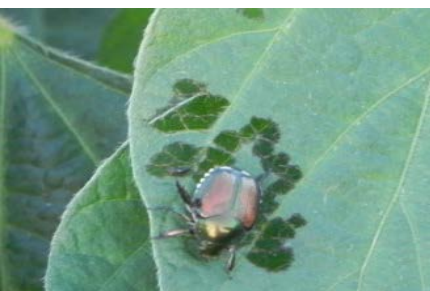
During pod fill (R4/R5/R6) stages of soybeans, there are many different insects that can affect final yield. **Late planted/Double-crop** beans can be at highest risk as insects look for lush growth and attractive sites to feed as other fields mature.



Yellow striped Armyworm



Fall Armyworm



Japanese Beetle



Green Cloverworm

Stallion® Brand Insecticide: 8.0-11.75 oz./A

Hero® Insecticide: 4.0-5.0 oz./A

OR Mustang® Maxx Insecticide: 3.2-4.0 oz./A

**See product label for complete list of rates for specific pests*

- During pod fill, the threshold for defoliation drops to 10-20%

Watch for **stink bugs**. They can result in damage to developing pods and seeds. Threshold is approximately 0.25 /sweep or **1 stink bug per 4 sweeps**.

Yellowstriped Armyworm

- Larvae dark to black with yellow stripe running down each side of body
- Black spot on each side of 1st abdominal segment
- Four pairs of prolegs

Fall Armyworm

- Larvae tan to green in color with black bumps on body
- Four distinct black spots on upper half of 8th abdominal segment
- Inverted “Y” on front of head
- Four pairs of prolegs
- Usually occurs late in season

Japanese Beetle - a widespread problem for a while in 2017

- Adults can feed on pods as well as foliage so feeding is more damaging late than earlier during soybean vegetative stages.
- Pod feeding can increase susceptibility to disease
- Threshold: 30% defoliation during vegetative stage, **15% during flowering, pod development, and pod fill**
- Common in MO and east, but moving into new areas of NE, KS, and OK

Green Cloverworm

- Light green with white stripes running down each side
- Full size larvae about 1 inch
- Three pair of abdominal prolegs
- When disturbed, larvae wiggle violently and fall to ground
- Usually the first in-season foliage feeding lep found in soybeans
- Threshold: Note defoliation threshold levels

Late Season Soybean Insect Management



21-Day PHI



28-Day PHI



21-Day PHI



Stink Bug

Stink Bugs

- Move into the North from the South on weather fronts
- Females lay 10-30 eggs per cluster
- Depending on species, it takes 23 days to 2 months from egg to adult
- Feed directly on pods and seeds
- Threshold: 1 / ft of row or 1 per 4 sweeps.



Garden Webworm

Garden Webworm

- Webworms are green to yellowish green and have three dark spots on the side of each segment
- As webworms feed, they roll or web leaves together and feed on the leaf area inside
- Late planted or double crop beans are most at risk
- Treat soybeans when 20-30% leaf area is showing damage



Bean Leaf Beetle

Bean Leaf Beetle

- Overwinters as an adult
- 2nd Generation feeds on pods in August, September.
- Direct damage from feeding on leaves and pods
- Indirect damage from spread of bean pod mottle virus



Soybean Podworm

Soybean Podworm

- Same as the Cotton bollworm, Corn earworm, Sorghum Headworm
- Larvae vary in color from yellowish-green to green, brown, pink and black
- Four pair of prolegs
- When disturbed, larvae curl up into a "C" shape
- When flowering threshold is 1 larvae/row foot and 5% of the pods are damaged



Grasshoppers

Grasshoppers

- Several species
- Feed on foliage and pods
- Typically found along field edges early in season and disperse throughout the field later in season
- Threshold: 30-35 percent defoliation before bloom, 20-25 percent after bloom and during pod fill

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Addendum on soybean podworms

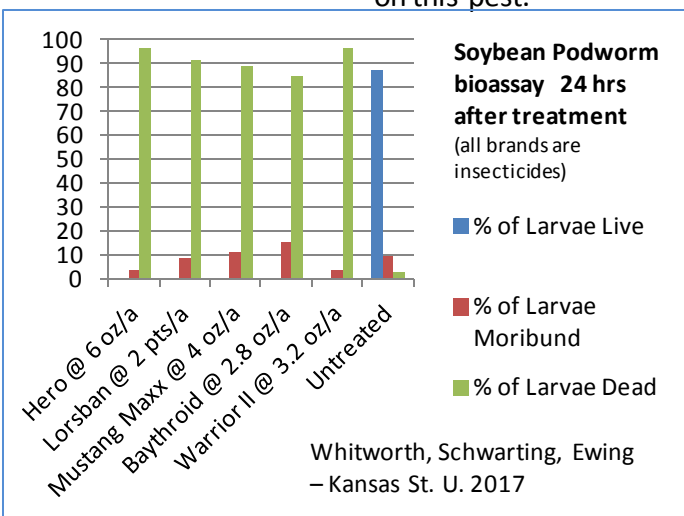
Every year we get a few calls about ‘resistance’ in podworms after pyrethroid insecticide applications. The pest, scientifically known as *helicoverpa zea*, is alternately known as corn earworm, tobacco budworm, cotton bollworm and is quite flexible in its host preferences. It overwinters in the south and carries north on high winds in the early summer dropping out over wide areas and mixing genetics freely. While increased tolerance to pyrethroids can be shown in local populations, often late in the season after 2 or 3 generations have been sprayed in some crops, but practically speaking, this doesn’t happen much in row crops in MO/KS.



Last season, after a report that ‘We didn’t kill those worms’, a consultant in southeast Kansas collected a great many larvae from a suspect field. These were sent to KSU Manhattan where they were subjected to a screening at common rates of popular insecticides. Petri dishes were sprayed at label rates and the larvae introduced into the dishes. Mortality was recorded over the next few hours. Results summarized below. Turns out these insecticides remained very effective on the sample of larvae from this field. This doesn’t mean there might not be tolerance somewhere else, but usually the cause of missing some worms is a matter of poor canopy penetration in rank late season soybean stands. This can be mitigated by increased water volume by air or ground and increased spray pressure by ground. Big worms may be somewhat slower to die, but they are also about to cycle out. Killing small ones that will continue feeding may be more important.



Make timely treatments and ensure good coverage. **Hero[®], Mustang[®] Maxx or Stallion[®] Brand** insecticides remain very effective on this pest.



HatchTrakSM



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Always read and follow label directions. **NOTE REGARDING RESTRICTED USE PESTICIDES: Anthem ATZ herbicide; Athena insecticide, Brigade 2EC Insecticide/Miticide, Brigade WSB Insecticide/Miticide, Brigadier Insecticide Capture 3RIVE 3D insecticide, Capture LFR Insecticide, Declare insecticide, Hero Insecticide, Mustang Insecticide, Mustang Maxx Insecticide, Pounce 25WP Insecticide, Stallion Brand Insecticide, Temityr LFR Insecticide/Fungicide, Triple Crown Insecticide, Ethos XB Insecticide/Fungicide and Gladiator Insecticide/Miticide are Restricted Use Pesticides.**

NOTE FOR CALIFORNIA: Accurate Extra herbicide, Aim herbicide, Aim EC herbicide, Aim EW herbicide, Anthem herbicide, Anthem ATZ herbicide, Anthem Flex herbicide, Anthem MAXX herbicide, Authority Assist herbicide, Authority Elite herbicide, Authority First DF herbicide, Authority MAXX herbicide, Authority MTZ DF herbicide, Authority XL herbicide, Cadet herbicide, Chisum Herbicide, Command 3ME microencapsulated herbicide, Crusher Herbicide, Edition Broadspec herbicide, Edition Tankmix Herbicide, Marvel herbicide, Nimble Herbicide, Nuance Herbicide, Preemptor SC fungicide, Report Extra Herbicide, Solstice herbicide, Spartan 4F herbicide, Spartan Charge herbicide, Spartan Elite herbicide, Temityr LFR Insecticide/Fungicide, Topguard EQ fungicide, Zeus Prime XC herbicide, Zeus XC herbicide, Capture 3RIVE 3D insecticide, Ethos XB Insecticide/Fungicide, Hero Insecticide, Mustang Maxx Insecticide, Display cotton harvest aid, Zoro Miticide and VGR Soil Amendment **are not registered for sale or use in California.** VGR Soil Amendment is not a pesticide. Beleaf and Carbine are trademarks of Ishihara Sangyo Kaisha, Ltd. Cercobin is a trademark of Nippon Soda Co., LTD. Sovran is a registered trademark of BASF. FMC, 3RIVE 3D, Accurate, Aim, Anthem, Athena, Authority, Brigade, Brigadier, Cadet, Capture, Chisum, Command, Crusher, Declare, Display, Edition, Ethos, Preemptor, Fracture, Fyfanon, Gladiator, Hero, Koverall, LFR, Marvel, Mustang, Nimble, Obey, Pounce, Report, Rhyme, Rovral, Shark, Solida, Solstice, Spartan, Stallion, Temityr, Topguard, Topguard Terra, VGR and Zeus are trademarks and HatchTrak and Investing in farming's future are service marks of FMC Corporation or an affiliate. ©2017 FMC Corporation. All rights reserved.

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