

The logo for AgBiTech features the word "Ag" in white, "Bi" in green with a stylized leaf icon, and "Tech" in white. The background of the slide is a photograph of a soybean field with rows of green plants under a cloudy sky.

AgBiTech

2019 Product Update

**Louisiana Agricultural Technology
& Management Conference**

February 11-13, 2019

Marksville, LA

Company Summary:

About AgBiTech:

- ❑ **Headquartered in Fort Worth, TX since 2017** – founded in Australia (2000)
 - Production, Technical Labs, and Administrative offices
- ❑ **Global leader in Nucleopolyhedrovirus (NPV) production** focused on manufacturing baculovirus-based bio-insecticides for caterpillar pest control
- ❑ **State-of-the-art production process:** automated *in-vivo* (live insect) production processes to manufacture high volumes of NPV
- ❑ **Market leader with proven commercial success** in Australia, Brazil and USA, with development activities in Africa and Europe



Market Development and Commercial Team - USA



Anthony Hawes
Co-founder &
Chief Technology
Officer



Dr. Paula Marçon
Global Development



Scott Tefteller
Vice President
Sales & Marketing



Brian Dockery
Commercial Director



Chris Dobbins
Market Development



Devin Drake
Market Development



Leslie Rogers
Market Development

USA Portfolio Overview:

AgBiTech is marketing and developing an expanding set of products in the USA to control caterpillars on soy, cotton, corn, sorghum and specialty crops

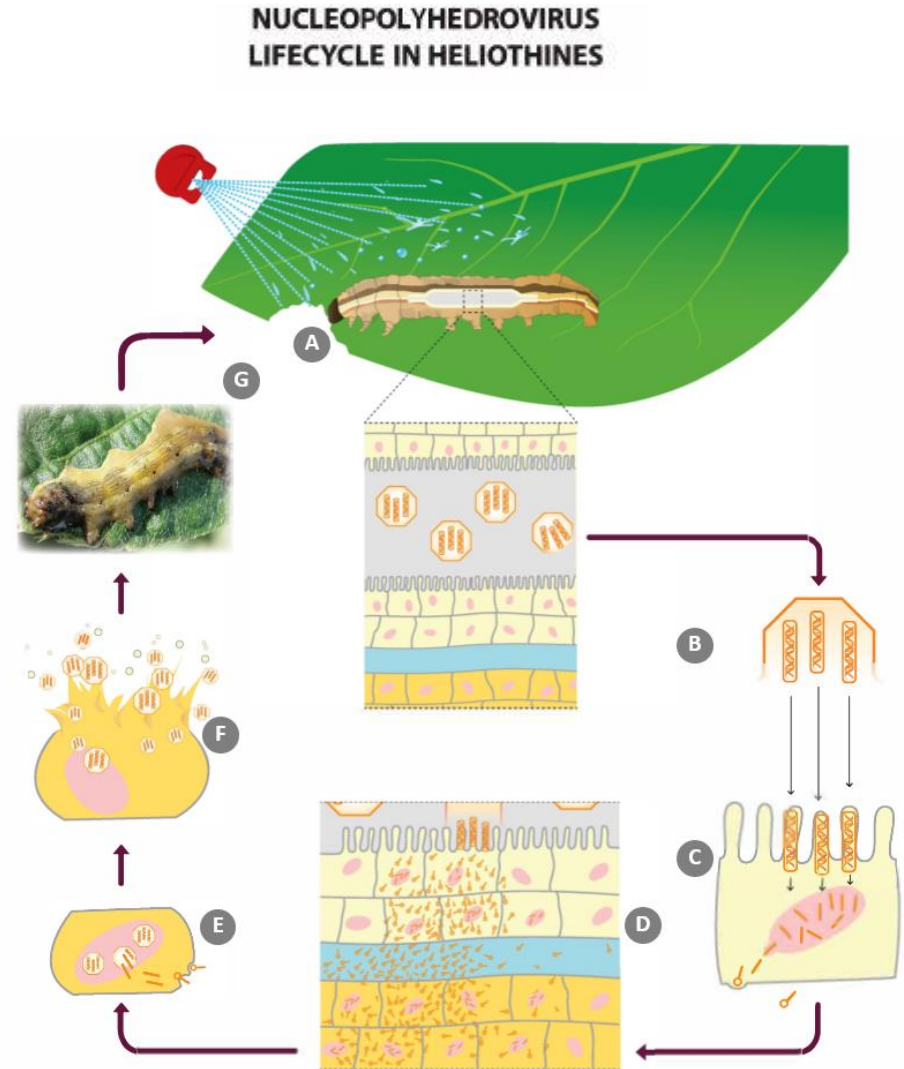
PRODUCTS	ACTIVE INGREDIENT(S)	KEY CROPS ¹	PEST(S) CONTROLLED	REGISTRATION DATE
	HearNPV	Soybean Grain sorghum Sweet corn	<i>Helicoverpa zea</i> <i>Heliothis virescens</i>	March 2014
	SfMNPV	Grain sorghum Pasture Rice Sweet corn Turf	<i>Spodoptera frugiperda</i>	November 2016
	ChinNPV HearNPV	Soybean Green beans Peanuts	<i>Helicoverpa zea</i> <i>Chrysodeixis includens</i>	2019 Pending Registration
	AcMNPV ChinNPV HearNPV SfMNPV	All crops including: Soybean, Sweet corn, Sorghum, Seed corn, Cotton, Vegetables	All pests including: <i>Helicoverpa / Heliothis</i> <i>Chrysodeixis includens</i> <i>Spodoptera frugiperda</i> <i>Plutella xylostella</i>	January 2020 (expected)

Notes:

1. Products will be registered by pest and approved for use on all crops

Nucleopolyhedrovirus (NPV):

- ❑ **Highly specific natural pathogens**
 - Most NPVs only infect caterpillars within a single genus
- ❑ **Exist outside host as occlusion bodies (OBs)**
 - Virus DNA embedded in a protective protein crystal
- ❑ **Host must ingest OBs for infection to occur**
- ❑ **Infected larvae become virus factories**
 - Larvae quit feeding 1-3 days after ingestion
 - Replicating virus ruptures host cells, causing death in 3-8 days.
 - Dying larvae release large quantities of OBs, infecting other host caterpillars → This is called horizontal transmission.
 - Virus will continue to kill larvae through continual horizontal transmission over the course of the season.



Early Symptoms of NPV Infection:



“Swollen” look



Sweat beads



Loss of control in hind legs

Later Stage Symptomology of NPV Infection:



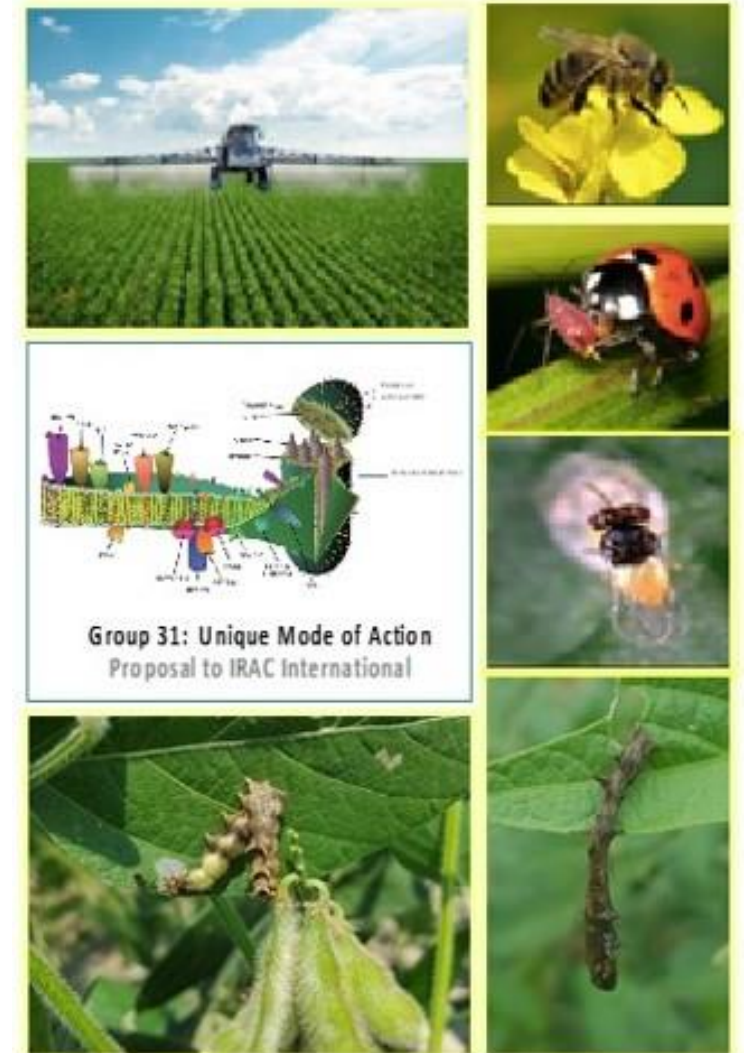
Virus can be spread by:

other insects, rain, wind, dew, cannibalism, and frass consumption



Why NPV is a good treatment option in soybeans:

- ❑ **Reduced efficacy of current insecticides**
- ❑ **Valuable resistance management tool:**
 - Alternate mode of action
 - No documented resistance issues
- ❑ **Preserves current insecticides longer:**
 - NPV's: applied early at "sub-threshold" infestation levels
 - Chemical insecticide's: use in heavy pressure situations where fast knockdown is needed
- ❑ **An effective tool that provides persistent control**
 - NPVs self replicate and provide persistent control of target caterpillar pests over the course of the growing season
- ❑ **Preserves beneficial species**
- ❑ **Compatible with other products**
 - Do not exceed a water pH of 8
- ❑ **Economical to the grower**



Cross Trial Analysis of US Soybean Trials:



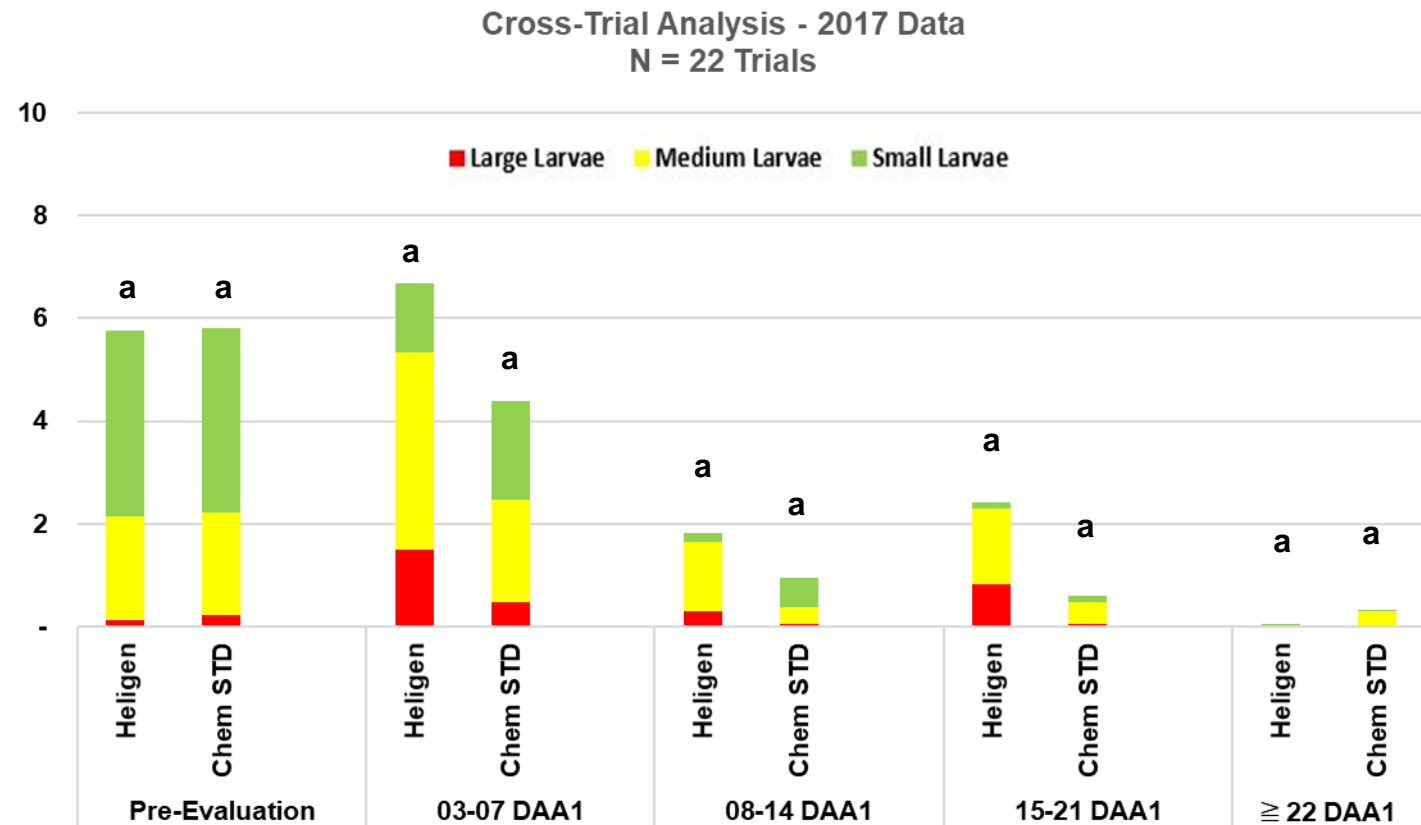
In a cross-trial analysis of 2017 field trials*:

- Heligen[®] provided good control of CEW
- Heligen[®] - though applied late in many instances - was statistically equivalent to the commercial chemical standard
- Heligen[®] maintained CEW below economic injury level throughout the course of the season

* In several of these trials, Heligen[®] was applied late – at or above action threshold for chemical insecticides.



Average Number of Larvae per 25 Sweeps



2018 Surtivo Soy Efficacy Trials

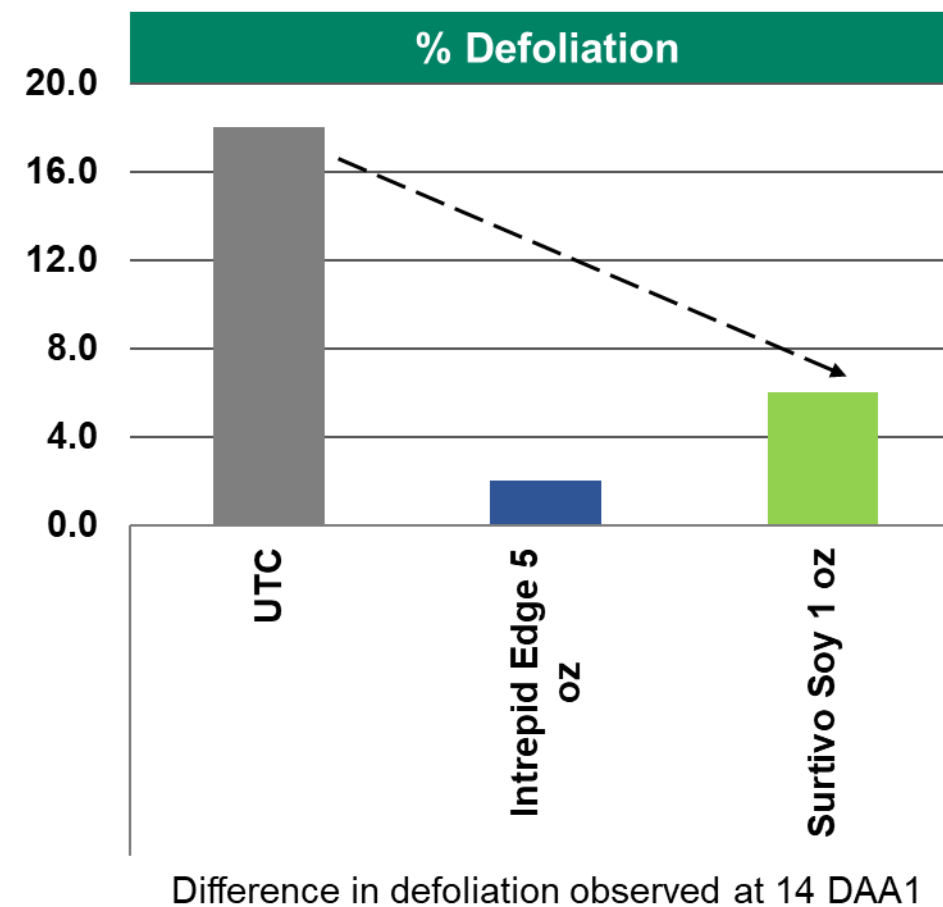
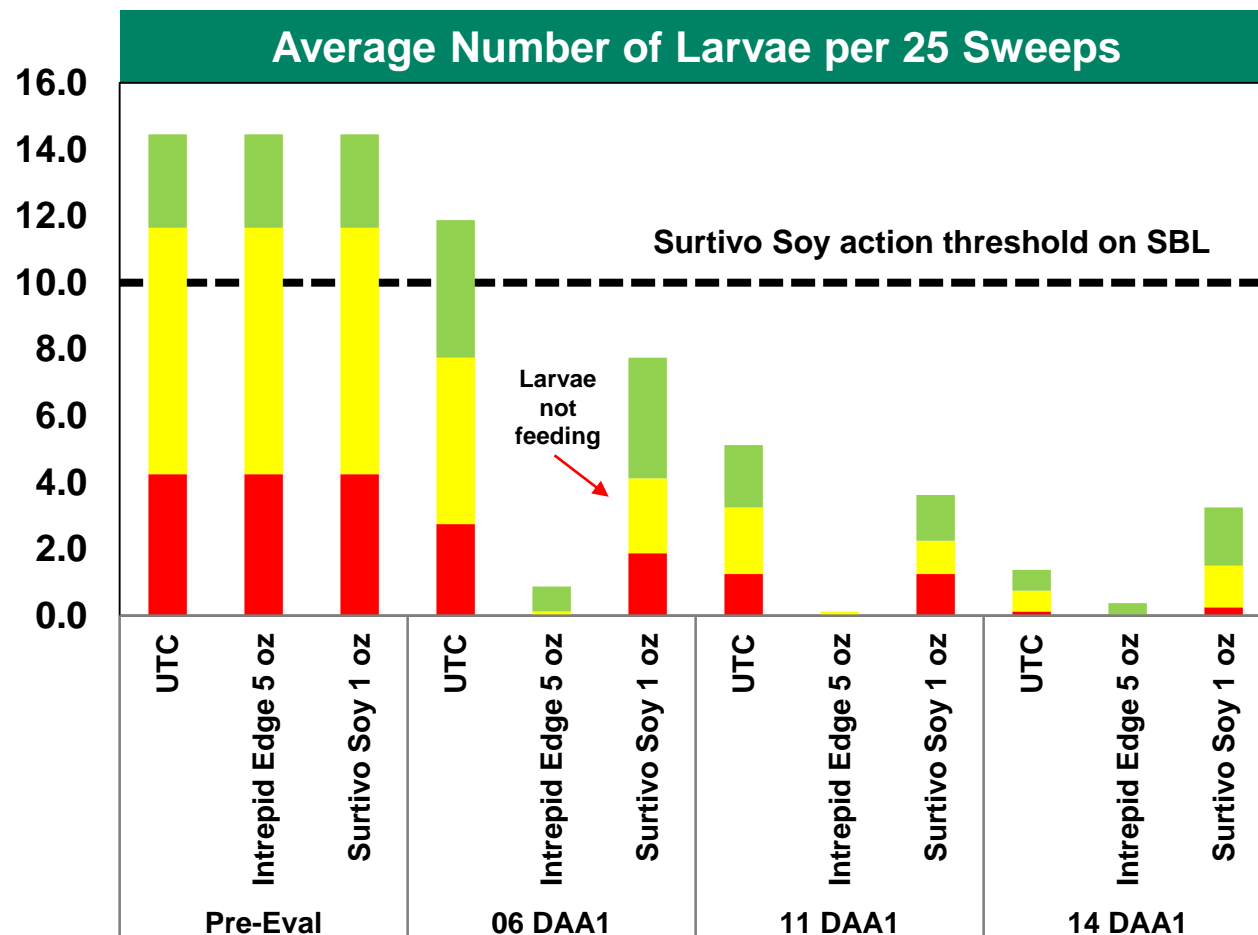
Don Cook, Mississippi State University



Surtivo Soy Performance on *Chrysodeixis includens*

Tallahatchie County - MS

Ground Application @ 10GPA; 10 acre blocks



Difference in defoliation observed at 14 DAA1

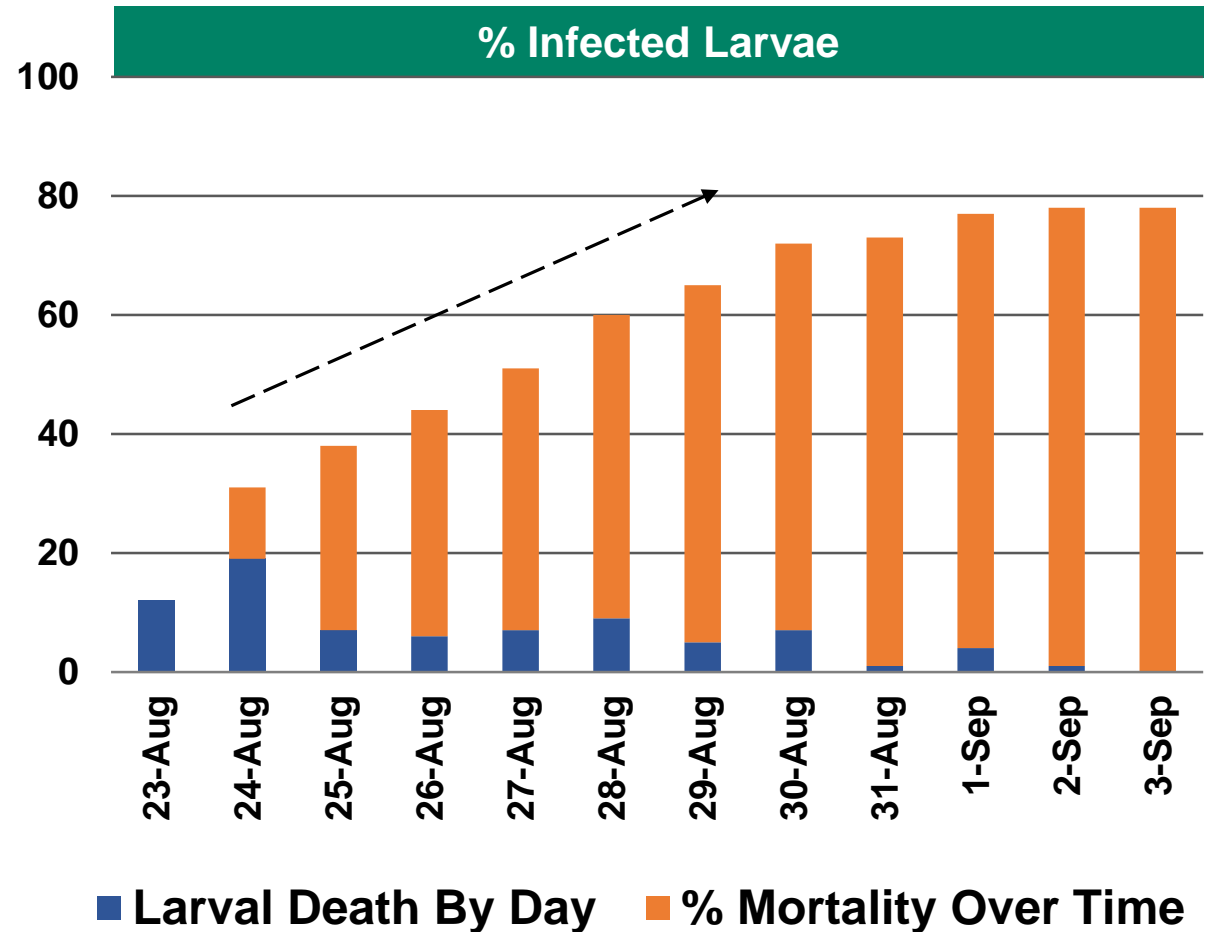
2018 Surtivo Soy Efficacy Trials

Don Cook, Mississippi State University

Larval Mortality – Surtivo Soy:

- ☐ Good results in larval mortality from viral infection
- ☐ 100 larvae collected from field
 - 78% mortality recorded

Surtivo Soy Performance on *Chrysodeixis includens*
Tallahatchie County - MS
Ground Application @ 10GPA; 10 acre blocks



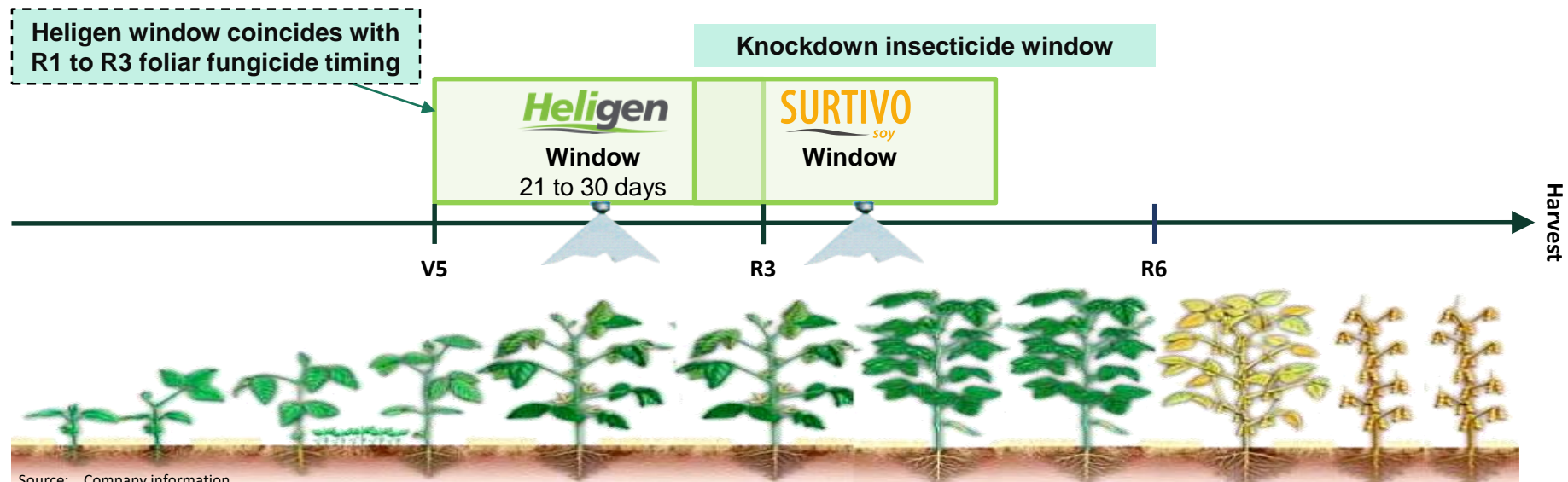
2019 Product Positioning:

Surtivo Soy
Pending Registration - 2019

Control of *Helicoverpa zea* and *Chrysodeixis includens* in soybeans:

Heligen + *SURTIVO*_{soy}

- The primary recommendation is to **apply Heligen at 1.0 to 1.6 fl oz per acre at the first appearance of corn earworm (CEW) larvae**, typically during vegetative to early flowering stages (VN to R3-R4)
- By applying at first appearance of CEW infestation, the NPV epizootic potential is maximized to provide season long control
- **Surtivo Soy** will be commercialized in 2019 and will provide **additional control of soybean looper**
- Heligen and Surtivo Soy are highly tank-mix compatible, so mixtures with other sprays are encouraged
- Some clean-up chemical insecticides will be required under higher pressure scenarios during pod-fill – estimated at less than 15% based on long term experience



Testimonials from Consultants and Growers - 2018:



"As growers are having to deal with resistant weed, disease and insect pest in their crops, Heligen gives us another tool to battle resistance with corn earworm. We use Heligen early season before corn earworm populations build significantly. It gives us improved control over pyrethroids and is much more economical than other options."

Ashley Peters, Peters Crop Consulting
Crowville, LA

"Heligen offers consultants a new option for controlling corn earworms in soybeans. Having a virus to add to our insecticide rotation will be crucial in preserving the chemistries we are currently using. Not only is Heligen IPM friendly, it is also economical compared to other options. I like to time applications of Heligen to small worms at half threshold"

Hank Jones, Consultant – RHJ Ag Services
Pioneer, LA

"I recommend Heligen to my growers because it's a cost-effective way to control podworm in soybeans. If applied at the right time and under the right conditions, it can provide lasting control and stop podworm from reaching economic threshold."

Matthew Guedon, Crop Consultant
Natchez, MS

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