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tential for phytotoxicity issues (see label recommendations for specific products). Soil texture, temperature and moisture can impact fumigant efficacy. Fumigants dissipate more quickly in lighter textured soils, such as sands. This is due to the ability of the product to infiltrate the large pore spaces. Dissipation will occur more quickly as soil temperatures increase. Finally, soil moisture is required both to form a seal so that the fumigants do not volatilize, and to improve kill of the nematodes.

### **Seed treatments**

**Orthene/Acephate – Thrips** - Acephate as a seed treatment does have thrips activity, but is extremely erratic, sometimes providing up to 7 days control post emergence and sometime no control. **Nematodes** – no activity.

**Gaucho 600, Acceleron I, and generics (imidacloprid)** – Imidacloprid has been around for quite a while and there are a number of generic seed treatments that use the same active ingredient. Imidacloprid is a systemic, neonicotinoid insecticide. **Thrips** - Versus western flower thrips imidacloprid will generally provide about 7 days control post emergence. **Nematodes** – no activity.

**Aeris** – Like Gaucho 600, Aeris contains the insecticide imidacloprid. However, it also contains thiodicarb. Thiodicarb is included with the imidacloprid for nematodes, but the addition

of this product appears to enhance thrips control as well.

**Thrips** - Versus western flower thrips Aeris will generally provide about 14-18 days control post emergence. **Nematodes** – Offers limited activity under low populations at the current use rate.

**Cruiser (thiamethoxam)** – Thiamethoxam is a systemic neonicotinoid insecticide.

**Thrips** -Versus western flower thrips thiamethoxam will usually provide about 14---18 days control post emergence. **Nematodes** – no activity.

**Avicta Duo, Avicta Complete Cotton, and Acceleron N** – Similar to Aeris, Avicta and Acceleron N are dual chemistry products; containing thiamethoxam for thrips and abamectin for nematodes. Avicta Complete Cotton and Acceleron N differ from Avicta Duo in that they also include a premium fungicide packet. **Thrips** - Versus western flower thrips, Avicta and Acceleron N will generally provide about 14-18 days control post emergence. **Nematodes** – Offers suppression of low populations.

**Poncho/VOTiVO** – Poncho/VOTiVO is the newest thrips/nematode product available for use on cotton seed. The active ingredient in Poncho is the neonicotinoid, clothiadan, and VOTiVO is *Bacillus firmus* I-1582, which targets nematodes. **Thrips** - Against western flower thrips, Poncho/VOTiVO is not recommended as a stand-

alone treatment but should include one of the aforementioned seed treatments. **Nematodes** – *B. firmus* I-1582 is a biological agent that reproduces on developing cotton roots, creating a physical barrier that is thought to disrupt the nematodes from establishing an infection site. It appears in limited testing to be less effective than Aeris, and when combined with Aeris, it has not improved performance over Aeris alone.

**N-Hibit** – This product is comprised of the Harpin protein, a natural plant compound that has been shown to stimulate plant defense responses. Research from around the Cotton Belt has shown a reduction in nematode damage (galls per plant) or reproduction with the use of H-Hibit; however, significant yield increases have not been observed.

### **Pros and Cons of seed treatment options**

#### **Pros**

1. Easy and safe to use.
2. Provides constant control for 7-18 days (depending on the product) which is during the most critical thrips control window
3. Aids in wireworm and early-season aphid control
4. Limited activity at low nematode populations

#### **Cons**

1. More costly than foliar sprays

2. Only provides 7-14 days of control and afterwards may need to be supplemented by foliar applications
3. May alter plant defense chemistry leaving plants more susceptible to mite outbreaks
4. May aid in selecting aphids that are more tolerant to neonicotinoid based aphid control products
5. Ineffective towards moderate and high nematode populations

**Foliar insecticides/  
Nematicides**

**Orthene/Acephate** – Acephate is the standard foliar thrips control product, and when used properly can provide good thrips control. **Thrips** - At the 3 oz/ac rate, acephate will generally provide about 5 days control. **Nematodes** – no activity.

**Bidrin (dicrotophos)** – Bidrin has long been used for aphid and stinkbug control, and in the past used more frequently for thrips. **Thrips** - At 3.2 fl-oz/acre it performs comparably to acephate, but based on limited data appears to provide slightly less residual control. **Nematodes** – no activity.

**Dimethoate** – Dimethoate is often used for thrips control on the High Plains and is usually priced competitively with acephate. At the 2 pt/ac rate it provides good knockdown, but based on limited data appears to provide slightly less residual control. **Nematodes** – no activity.

**Vydate (oxamyl)** – Vydate is one of those rare insecticide/nematicides that will translocate from the leaves down to the roots, and has thus been widely used in recent years for aid in the control of nematodes when Temik begins to lose efficacy. However, in the absence of Temik, there is interest in using Vydate earlier and there are questions regarding its efficacy toward thrips and nematodes when used early. **Thrips** - The Vydate label suggests suppression only of thrips. In a single study at the 17 fl- oz/ac rate, at times provided control similar to Orthene at 3 oz/acre, but did not perform as well other times. More data is needed to fully assess its activity towards thrips. **Nematodes** – Information regarding the efficacy of Vydate on nematode control is sporadic, and data evaluating the sole use of Vydate (not following Temik) is limited. Small plants (< 30 days old) may not have enough leaf surface to absorb enough Vydate to effectively control nematodes.

**Things to consider when using foliar applications for thrips and nematode control**

1. *Timing is critical.* Controlling thrips during the first 2 weeks post crop emergence appears to be the most important period; especially under cool conditions. You need to be “Johnny on the spot” with these applications when thrips are numerous; even a few days delay can be detrimental.
2. *Avoid automatic treatments.* Automatically adding a foliar

thrips material in with a Roundup application may not be necessary or may be poorly timed. Often either the weeds aren’t present when the thrips are or vice versa.

3. *Scout for thrips.* Go out and visual assess if thrips are present. Pull up plants and thoroughly search them or beat the plants inside a plastic cup.
4. *Don’t spray based on damage.* The damage you see today happened 3 to 5 days earlier and you may have already suffered yield loss. Spraying based on damage is essentially a revenge treatment.
5. *Spray based on thresholds.* Use an accepted action threshold to help you determine whether or not you should treat.

Thresholds for foliar thrips sprays	
Cotton State	Threshold
Cotyledon-1 true leaf	0.5 thrips/plant
2 true leaves	1 thrips per plant
3 true leaves	1.5 thrips per plant
4 true leaves	2 thrips per plant
5-6 true leaves	Rarely justified

**Variety selection**

Although variety selection is not thought to have much influence regarding thrips protection, it is very important with regard to nematodes. Utilization of partially resistant varieties, such as Deltapine 174RF, Phytogen 367WRF, Stoneville 42288B2F and Stoneville 5458B2RF, can minimize nematode related losses.

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**Rotations with a non-host crop (nematodes)**

Crop rotations utilizing poor or non-host crops can reduce nematode populations in the soil. Grain sorghum is generally considered a good rotation crop with cotton. Although, nematodes can reproduce on grain sorghum levels are not typically as great as cotton following cotton. Peanuts are an exceptional rotation option, capable of reducing nematode populations by >90%. Corn is considered a poor rotation choice. Yield loss is not typically experienced due to nematode damage; however, the large fibrous root system produced by corn can support high levels of nematode reproduction.

Other crop management factors must also be considered when dealing with nematodes. As a general rule, all other potential stresses should be alleviated. Stresses such as drought stress or nutrient deficiencies often compound nematode damage leading to increased yield losses.

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