



## Cleaning Sprayers to Avoid Crop Injury

Daniel Stephenson, Ph.D. and Sandy Stewart, Ph.D.

Initial over-the-top glyphosate applications are either being made or soon will be made on most Louisiana cotton fields. Many of the sprayers that will be used have also been utilized for burndown applications. Residue from 2,4-D and other burndown applications in a sprayer has always been a concern and is sometimes responsible for crop injury.

*“Crop injury from sprayer contamination can even occur several months after using the sprayer without proper cleanup.”*

There is no foolproof way of totally cleaning 2,4-D from a sprayer. LSU AgCenter research has not identified a cleaning method to totally eliminate 2,4-D from sprayers, but the likelihood of some cotton injury appears to increase as EC-formulated insecticides such as

dimethoate are added to tank-mixes with glyphosate. Although there are no known ways of totally eliminating the chance of some residue being in a spray system, the following offers a refresher on good practices for cleaning sprayers following applications of any crop protection chemical.

Proper maintenance and use of sprayers is essential for efficient, trouble-free operation. A major portion of proper maintenance is cleanout after use, which is critical after use of certain herbicides because of the potential for crop injury from spray residues in subsequent applica-

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## Cool Weather, Slow Growth and Thrips

Ralph Bagwell, Ph.D. and Sandy Stewart, Ph.D.

In the May 6 issue of the Louisiana Cotton Bulletin, the cool temperatures, slow accumulation of DD60s, and concerns about the possibility of thrips damage were all highlighted. At the time those articles were written, it was assumed that warmer temperatures would return and seedling growth would follow. While there have been one or two days since

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### Upcoming Dates:

- Northeast Research Station Field Day, St. Joseph—June 24
- Dean Lee Field Day, Alexandria—Aug. 21

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tions. Crop injury from sprayer contamination can even occur several months after using the sprayer without proper cleanup.

Flushing and rinsing with water may be sufficient for some herbicides, but others require additional cleaning agents for thorough cleaning. Rinsing with water is a form of dilution; thus, multiple rinsing with small quantities of water is better than a single rinse with a large quantity of water. However, the use of cleaning agents increases the solubility of the herbicide in the rinse solution, which allows for better cleanout. Remember, the best source of sprayer cleaning information is the pesticide label because it often specifies a particular tank-cleaning agent.

Always use common sense when cleaning a sprayer. Make sure that it is cleaned in an area not accessible to children or animals. Do not clean the sprayer near water supplies to prevent contamination. Proper disposal of all rinsate materials is a must.



*2,4-D injury from a contaminated spray rig. Note the injury is only evident on one pass and lessens toward the end of the field.*

Below is a general stepwise procedure for cleaning a sprayer:

1. Drain spray system. Loosen and physically remove any visible herbicide deposits.
2. Rinse the inside of tank paying close attention to areas around tank fill access, baffles, and tank plumbing.
3. Flush hoses, boom, and nozzles with clean water.
4. Fill tank with water and add 1% v/v of household ammonia (use a 3% active ammonia product) or a commercially available tank cleaning agent according to label instructions.
5. Operate the pump to circulate the solution through the sprayer for 15 to 20 minutes.
6. Spray a small amount of the solution to ensure that all nozzles and boom lines are filled with cleaning solution.
7. Let sit for several hours, but overnight is a preferred amount of time.
8. Drain the tank and flush the solution out of the hoses, boom, and nozzles again.



*Valor injury from mis-application on small cotton.*

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## Cleaning Sprayers (cont'd from Page 2)

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9. Remove the nozzles, screens, and strainers and clean separately in a bucket of water and cleaning agent.
10. Repeat steps 4 and 5.
11. Drain the tank.
12. Rinse the system one final time with water.

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## Cool Weather, Slow Growth, and Thrips (cont'd from Page 1)

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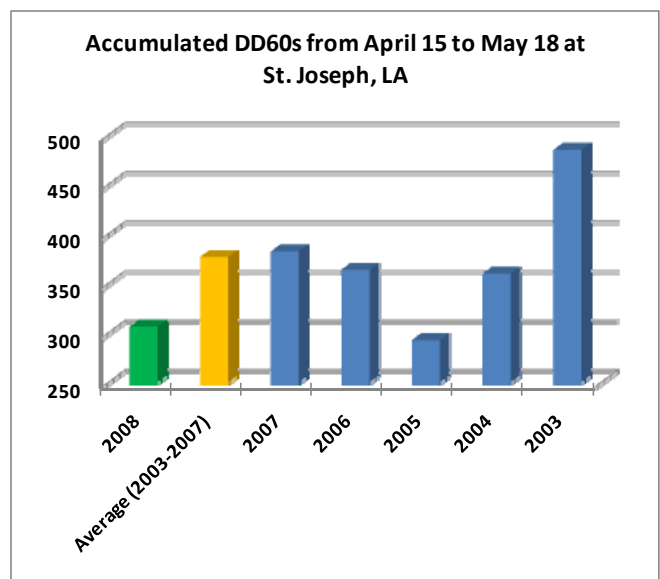
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May 6 with temperatures approaching the 90s, cooler days with nights in the 50s or low 60s has been the norm.

As can be seen from the graph, DD60 accumulation from April 15 through May 18 at St. Joseph in 2008 is 70 DD60s behind a 5-year average. This is not the coolest start over the five-year period, as 2005 actually had a lower number of DD60s at this point than 2008.

The continued cool weather has slowed cotton development to almost a standstill. The slow growth leaves seedlings vulnerable to thrips, seedling disease, and early weed competition for a long time. A basic fact of cotton production is that the amount of protection a seedling needs is a function of how quickly it emerges and grows off. In 2008, there have generally been adequate conditions for cotton to emerge, but plants have 'grown off' very slowly. Seed treatments and in-furrow insecticides and fungicides cannot be expected to provide protection for more than 21 days under the best of conditions.

Because of the likelihood of thrips infesting slow-growing cotton, especially near wheat fields, some



points concerning thrips management should re-stated. Treatment of thrips is only recommended when immature (wingless) thrips are present. The presence of immatures indicates that reproduction is occurring in the field. Reproduction occurs only after the at-planting insecticide becomes non-effective. Recommended foliar treatments, at broadcast application rates are shown in the table on Page 4.

Insecticides recommended for thrips control are systemic, thus thrips are exposed only to the

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## Cool Weather, Slow Growth and Thrips (cont'd from Page 3)

LSU AgCenter Recommended Foliar Insecticides for Thrips Control.			
	Amount Product	Lb Active Ingredient	Acres Treated
Insecticide	Acre	Acre	Gallon or lb.
acephate (90)	3.2 oz	0.18	5
Bidrin (8)	3.2 oz	0.2	40
Dimethoate (4)	6.4 oz	0.2	20
Dimethoate (5)	5.1 oz	0.2	25
Orthene (97)	3.0 oz	0.18	5.3

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insecticide by feeding on the treated plant. After feeding on a treated plant, they normally die, but the act of feeding by the large number of thrips results in significant damage. Slow plant growth is causing more damage, because thrips are feeding on the same plant tissue for extended periods.

There have been some questions about labels for tankmixes of insecticides with Sequence, Dual Mag-

num, and other formulations of metolachlor. The Sequence label states "Sequence can be tankmixed with the following insecticides: Centric®, Karate® Insecticide with Zeon™ Technology." The Dual Magnum and metolachlor labels state "Do not apply over-the-top in fluid fertilizer or any other adjuvant, surfactant, oil, or other pesticide not recommended in the cotton section of this label, or injury may occur." As always, read and follow all pesticide labels.

## Is Replanting Crucial Following 2,4-D or Harmony Extra Injury?- Derek Scroggs and Donnie Miller, Ph.D.

Making the decision to replant after any situation can be difficult. When plant stand is severely affected or large skips are present in a field, then the decision to replant may be easy. In most of these cases, cotton plants would be completely destroyed or would not come up at all. But what if the cotton plants are still there, but have been severely stunted or injured due to herbicide injury?

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## 2,4-D, Harmony Injury and Replants (cont'd from Page 4)

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Two common situations that come to mind are cotton injury from 2,4-D or Harmony Extra. Cotton can be injured by these two herbicides from off-target applications (drift), accidental application, or contaminated sprayer hose. The main symptom of 2,4-D injury to cotton is epinasty, which is the downward twisting and curvature of stems. Other symptoms include stem swelling, stem elongation, leaf strapping, or leaf curling. Harmony Extra is made up of two active ingredients, thifensulfuron-methyl and tribenuron-methyl. Cotton injury symptoms caused by Harmony Extra mostly include yellowing in the terminal, reddening of the leaf veins, and stunting.

In 2007, two studies were conducted in Alexandria, St. Joe, and in Stoneville, MS, to determine if replanting was necessary after cotton injury from reduced rates of 2,4-D or Harmony Extra. Treatments for both studies included reduced rates of each respective herbicide that were equal to 0, 1/4, 1/8, 1/16, 1/32, and 1/64 of the standard rates (12.8 oz/A for 2,4-D and 0.3 oz/A for Harmony Extra). Cotton was planted between May 1 and May 9 and treatments applied when the cotton was between 3 to 4 leaves. Also included in the studies were treatments that received no herbicides but were planted later (between June 1 and June 15) to simulate a replanting situation.

Data collected from these studies revealed significant visual injury from 2,4-D and Harmony Extra applications. The greatest visual cotton injury for both herbicides resulted

from the higher rates and resulted in injury ratings of 90 and 70%, for 2,4-D and Harmony Extra, respectively. However, when treatments that received the herbicide applications were compared to those that did not (replanted plots), cotton yield indicated that the plots with the cotton injury yielded at least similar to the replant cotton. This tells us that even though we received upwards of 90 and 70% injury from 2,4-D and Harmony Extra, it did not pay to replant 3 or 4 weeks later in June.

Although yield was similar for treated and non-treated cotton, plant growth was definitely affected. NAWF counts revealed a delay in maturity existed from treatment applications compared with non-injured cotton. This delay in maturity can affect management decisions and expose the crop more to late-season rains and tropical storms.



***Cotton injury from Harmony Extra.***



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