

Choosing Harvest Aid Chemicals

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A variety of harvest aid chemicals exist to prepare cotton for harvest and can be classified into four main categories: defoliant, desiccant, boll opener/conditioner, and boll opener/defoliant. **These chemicals are applied to enhance the natural process of defoliation and boll opening, so it is critical that the crop is stressed but still physiologically active for effective defoliation to occur.**

Defoliant are chemicals that impact plant hormonal balances to cause the leaves to fall off. Defoliant activity is highly temperature dependent. But in general, most defoliants need about 2 weeks to remove leaves from cotton plants. **Desiccant** normally dehydrate and kill the leaves within one to several days. They are often applied after defoliants to remove the remaining leaves and/or kill juvenile growth or young tissue at the growing points of the mainstem and lateral branches. Note that desiccants can injure unopen bolls and that sodium chlorate (a desiccant & defoliant) cannot be mixed with ethephon-containing products. Chemicals that inhibit regrowth can reduce young, green tissue which may occur at the axillary positions along the mainstem.

Boll openers/conditioners are applied with defoliants to enhance the boll opening process. Ethephon-based products (boll-openers) can also be used alone as a conditioning treatment either before or after a defoliation event. **Boll openers/defoliants** can increase the percentage of open bolls and reduce vegetative regrowth at the same time.

It is important to note that the application rate for harvest aid chemicals should be lower when the temperature is warmer, and higher when it is cooler. A rule of thumb is to use low rates when accumulated heat units (86/55°F) in the next 14 days will be over 300 (~90° day & ~70°F night), medium rates when the heat units will be 200–300 (~80° day & ~60°F night), and high rates when the heat units will be less than 200 (~70° day & ~40°F night).

Expected activities of harvest aid chemicals

(Based on results from University of Arizona field trials & manufacturers' recommendations)

Harvest aid chemicals	Defoliation of mature leaves	Control of regrowth	Boll opening	Effect on young growth
Carfentrazone-ethyl	●	○	×	●
Thidiazuron + Diuron	●	●	×	●
Thidiazuron	●	●	×	●
Tribufos	●	○	×	○
Flumiclorac pentyl ester	●	○	×	●
Pyraflufen ethyl	●	○	×	●
fluthiacet-methyl	●	◐	×	●
Endothall	◐	●	×	◐
Sodium Chlorate	◐	○	×	◐
Paraquat	×	○	○	●
Ethephon	◐	○	●	○
Ethephon + Cyclanilide	◐	◐	●	◐
Ethephon + Urea sulfate	◐	◐	●	◐

● Excellent, ◐ Excellent to fair, ◐ Fair to poor, ○ Poor, × No activity

Product	AI	AI/Gal (lb)	Rate (oz/A)	Season limit
Defoliant				
Aim EC ⁸	carfentrazone-ethyl	2	up to 1.6	3.2
Aim EW ⁸	carfentrazone-ethyl	1.9	up to 1.6	3.2
Resource ¹⁹	flumiclorac pentyl ester	0.86	6-8	14
Blizzard ⁵	fluthiacet-methyl	0.91	0.5-0.6	1.25
ET ¹⁴	pyraflufen ethyl	0.21	1.5-2.75	5.5
Daze 4SC ¹ , Freefall SC ¹⁵				
Klean-Pik 500SC ¹¹	thidiazuron	4	3.2-6.4	9.6
Thidiazuron 4 SC ^{2,12}				
Dropp SC ³ , Takedown SC ¹⁰	thidiazuron	4	1.6-6.4	9.6
Daze 50WP ¹ , Dropp 50WP ³	thidiazuron	0.5††	0.2-0.4‡	0.6‡
Thidiazuron 50 WSB ¹²				
Dropp Ultra ³ , Ginstar EC ³				
Ginmaster ¹⁰ , Redi Pik 1.5EC ¹¹	thidiazuron + diuron	1*	6.4-16	16
Thidiazuron-Diuron EC ¹²				
Thidiazuron-Diuron SC ²				
Def 6 ³	tribufos	6	21-32	40
Desiccant / Defoliant				
Accelerate ⁴	endothall	0.52	16-24	↓
2lb Sodium Chlorate ⁷	sodium chlorate	1.84	192-384	↓
First Choice ¹⁰				
Defol 5 ⁶	sodium chlorate	5	77-154	154
Defol 6W ⁶	sodium chlorate	6	64-96	↓
Defol 750 ⁶	sodium chlorate	7.5	51-102	102
Poly-Foliant 5 ¹³	sodium chlorate	5.4	128-192	↓
Desiccant				
Bonfire ¹⁸ , Firestorm ⁵				
Gramoxone Max ¹⁷				
Paraquat Concentrate ¹⁶	paraquat dichloride	3	3.7-10.7	21
Parazone 3SL ¹¹ , Quik-Quat ⁶				
Gramoxone Inteon ¹⁷	paraquat dichloride	2	8-16	32
Boll Openers / Conditioners				
Boll Buster ¹⁰ , Boll'd ¹				
Ethephon 6 ² , Prep ³	ethephon	6	21-43	43
Setup 6SL ¹¹ , Super Boll ¹⁵				
Flash ⁹	ethephon	3	32-86	86
Boll Openers / Defoliant				
Finish 6 ³	ethephon + cyclanilide	6†	21-43	43
Finish 6 Pro ³	ethephon + cyclanilide	6††	21-43	43
Cotton Quik ¹⁵ , First Pick ¹⁵	ethephon + urea sulfate	2.28**	96-112	112

AI, active ingredient
Gal, Gallon
oz, ounces
*, 0.5 lb/Gal Diuron
**, 2.28 lb/Gal Urea sulfate
†, 0.75 lb/Gal Cyclanilide
††, 0.375 lb/Gal Cyclanilide
‡, lb (dry formulation)
‡‡, lb/lb (dry formulation)
↓, Not specified

1, AgriSolutions	11, Makhteshim Agan of North America
2, Arysta LifeScience North America	12, Micro Flo Company
3, Bayer CropScience	13, Moore Agricultural Products
4, Cerexagri-Nisso	14, Nichino America
5, Chemtura Corporation	15, Nufarm Americas
6, Drexel Chemical Company	16, Solera Source Dynamics
7, Fertilzation	17, Syngenta
8, FMC Corporation	18, United Phosphorus
9, Helena Chemical Company	19, Valent
10, Loveland Products	

Also see:

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