

2007 Cotton Defoliation Guidelines for Louisiana



Introduction

One of the last, but most important, steps in producing a cotton crop is harvest preparation. Successful harvest preparation includes scheduling for defoliation and harvest operations, removal of foliage and facilitating boll opening. Successful defoliation has many benefits including increased picker efficiency, elimination of trash in harvested seedcotton, faster drying of dew thereby increasing picking hours per day, straightening of lodged plants and reduction of boll rot incidence.

Cotton defoliation has often been referred to as “black magic” because of variability in response to defoliation often observed year to year. The activity of harvest aids is very dependent on environmental factors. Moreover, cotton defoliation is a balancing act between leaf injury that stimulates leaf drop, yet does not desiccate and stick leaves on the plant. No one harvest aid tank mix will work in all situations. A good understanding of the influence of defoliation timing and the relative attributes of available harvest aids can help in deciding when to terminate a crop and which harvest aids to use.

Defoliation Timing

There is always a balancing act between yield and fiber quality when defoliating cotton, but close attention to individual fields can help maintain quality while preserving yield. There are several accepted methods to time defoliation, and all methods have strengths and weaknesses. The following is a refresher of some of the more common defoliation-timing techniques.

Percent Open Bolls

The most widely used method is based on a determination of the total percentage of bolls in a field that have opened, with 60% of bolls open being the most common recommendation for defoliant application. In many situations, unopened bolls are mature enough to resist negative impact and will open before harvest. This method, however, has limitations. Research in Louisiana has shown that, depending on fruit distribution on the plant, maximum yield can be obtained when defoliation occurs before 60% open bolls. Additionally, in cases where a large fruiting “gap” (no bolls present at fruiting sites) occurs and a large percentage of bolls are less mature and set in the uppermost region

of the plant, optimum defoliation timing may occur later than 70% open. Research evaluating optimum defoliation timing in Louisiana and other states has shown maximum yield can be achieved with application ranging from 42% to 81% open, depending on crop maturity and fruit distribution.

Nodes Above Cracked Boll (NACB)

The node above cracked boll (NACB) method, in contrast to the percent open boll method, focuses on the unopened portion of the crop. NACB is determined by locating the uppermost first-position boll that is cracked open with visible lint and counting the number of main-stem nodes to the uppermost harvestable boll. By focusing on the unopened portion, NACB takes into account potential fruiting gaps. Most recommendations call for defoliation at **four NACB**. Low plant population and skip-row cotton, however, are often more safely defoliated at three NACB. Lower plant population usually means a later-maturing crop, with a significant portion of yield coming from outer-position bolls and bolls set on vegetative branches.

Accumulated Heat Units After Cutout

Similar to NACB, a method recently developed in Arkansas recommends defoliation after accumulation of 850 heat units, or DD60s, after cutout. A DD60 is a measure of accumulated heat needed for growth and development using a 60° F minimum. Research from Louisiana indicates that under our conditions, the appropriate defoliation timing may be greater than 850 heat units (that is, 1050 heat units) beyond a cutout of node above white flower 4 (four main-stem nodes above uppermost first-position white flower). While this method does focus on the unopened portion of the crop and is supposed to allow enough time and DD60s for full development of all bolls, it requires making a determination of cutout. The definition of cutout is a moving target and can often be different for every field.

Visual Inspection

Whatever method is employed, growers should also visually inspect unopened bolls for maturity. A boll is considered mature if it is difficult to slice in cross-section with a knife and seeds have begun to form a brown or black seed coat. Once a dark seed coat has formed, defoliation will not affect yield of those bolls adversely. Cotton bolls need 40 to 60 days to mature, depending on temperature. Bolls set later in the season will take longer to mature and may never be harvestable.

Growers should walk their fields before defoliation and examine only those bolls that can reasonably be expected to mature.

Research in Louisiana has shown that, on average, cotton is harvested from a 12-14 node range on the plant. This fact can serve as a tool to simplify identifying the last harvestable boll as well as timing defoliation. To use the 12-node rule, identify the lowest first position boll that is expected to be harvested. Count up 12 nodes on the plant. The boll present at that position is likely to contribute to yield. Under some circumstance, a boll on the 14th node from the bottom could be considered harvestable. Bolls produced above that position on the plant are unlikely to contribute to yield and waiting on them to mature places heavier bolls at the bottom of the plant at risk to unnecessary weather-related losses. Once the last harvestable boll has been identified, use the visual inspection technique to determine when it is mature and ready for defoliation.

Harvest Scheduling

Harvest capacity also should be a consideration in relation to defoliation timing. In general, defoliating only the amount of acreage that can be harvested within the 12-day period following treatment greatly reduces exposure of lint to weathering loss and possible grade discounts. Additionally, a delayed harvest may require regrowth to be controlled more aggressively using higher rates of regrowth-inhibiting products. In severe cases, an additional application of desiccant may be required to remove regrowth.

Defoliation may not always be warranted because cotton that is completely cutout will drop some of its leaves naturally. If cotton is harvested with care, defoliation may not be needed to eliminate leaf trash and prevent excess staining. Before proceeding with this option, growers are strongly urged to harvest an adequate sample to evaluate effects on ginning efficiency. Limited research in Louisiana has suggested that as little as 20% green leaf (mature and juvenile) on the plant can significantly affect final grade and loan value when a single lint cleaning operation is used. Therefore, growers are urged to proceed with caution when deciding to eliminate defoliation.

Defoliation of Late-Maturing Varieties

Much of the Louisiana crop is planted to full-season varieties such as DP 555 BG/RR and STV 5599 BR. Full-season varieties tend to initiate fruiting on higher nodes and cutout earlier compared with earlier varieties. The implication for defoliation timing is that these varieties are more likely to continue to produce small, green bolls in the top of the plant. The value of waiting on these bolls is questionable, especially considering the relative lack of “stormproofness” of these varieties. The temptation, however, will be to wait on those bolls at the top of the plant to mature. In many

cases, these varieties may need to be picked with some green bolls at the top of the plant, but this can be done without reducing overall yield.

Defoliation Materials

The following is a list of most of the products available for use as harvest aids and a discussion of their relative attributes. No one harvest aid, or tank mix combination, is appropriate for every field and all situations. The selection of a harvest aid is often made based on prior experience and price. When selecting a harvest aid or combination, consider environmental and crop conditions, yield potential and value of the crop in the field. All have strengths and weaknesses and perform better in some environments than others. Always read and follow label directions.

Def, Folex: Def and Folex are phosphate-based compounds that provide good to excellent defoliation over a range of environmental conditions but minimal regrowth inhibition. Activity of these compounds improves with increased cutout of the crop. Def or Folex can be tankmixed with many other materials. Leaf removal is usually rapid, and addition of surfactants or crop oils has increased activity only under adverse conditions. Use rates can range from 4 oz. in combination with other defoliant to 1.5 pts of Def or Folex alone.

Dropp, Freefall, Klean-Pik (thidiazuron): Thidiazuron is the active ingredient in several products sold under the trade names of Dropp, Freefall, Klean-Pik and Thidiazuron. Some are liquid and some are dry formulations.

Thidiazuron defoliates mature leaves as well as phosphate-based materials but also has excellent activity on juvenile leaves and inhibits regrowth. A minimum of 0.05 lb. ai per acre is needed for 10-14 days of regrowth inhibition. Higher rates will result in longer periods of regrowth inhibition. Thidiazuron alone is usually as good as or better than other defoliant in drought-stressed situations where leaves have thick cuticles. Thidiazuron is somewhat slower acting than other defoliant, and activity is temperature-dependent. Temperatures lower than 70°F will reduce activity. The addition of crop oil concentrate or a phosphate defoliant or insecticide will help the activity of thidiazuron under cooler conditions. Thidiazuron requires a 24-hour rain-free period; however, the addition of 2-4 ounces of Def or Folex will shorten the required rain-free period. It is important to follow suggested tank clean-out procedures to avoid premature defoliation when the sprayer is used the following year. A 0.5% silicone-based surfactant is recommended to aid in tank cleanout when thidiazuron is tankmixed with a phosphate defoliant or insecticide.

Thidiazuron is produced in dry and liquid formulations. Liquid formulations are Dropp SC, Freefall SC, and Thidiazuron 4 SC. Dry formulations are Freefall, Klean-Pik and Thidiazuron 50 WSB. At equivalent rates of active ingredient per acre, defoliation and regrowth control activity of liquid and dry formulations are similar. Limited research has indicated that the liquid formulations may be more prone to low levels of leaf desiccation when applied in combination with higher rates of Def or Folex and/or crop oil concentrate. The following table can be used to determine equivalent rates of thidiazuron in liquid and dry formulations:

Active ingredient (lb/acre)	Dropp SC, Freefall SC and Thidiazuron 4 SC (oz. product/acre)	Freefall, Klean-Pik and Thidiazuron 50 WSB (lb product/acre)
0.05	1.6	0.10
0.075	2.4	0.15
0.10	3.2	0.20

Ginstar: Ginstar is a premix formulation of thidiazuron and diuron. Ginstar has all the positive attributes of thidiazuron alone and is more active under cooler conditions. Ginstar is also a strong inhibitor of terminal regrowth, but it is more likely to cause unwanted desiccation of cotton leaves than thidiazuron alone. Higher rates and tank mixtures increase this potential. Activity of Ginstar is similar to phosphate defoliant under cooler conditions and usually faster than thidiazuron alone in warm conditions. Ginstar is rate-sensitive. The label allows a range of 6.4 to 16 ounces per acre. Growers are cautioned that rates in excess of 10 ounces have shown a tendency to desiccate leaves. Ethephon-containing materials (Prep, SuperBoll, Finish, CottonQuik) can be tankmixed at low rates for enhanced defoliation. The use of adjuvants with Ginstar is not recommended. Limited research in Louisiana has also shown some benefit to tankmixing 3 oz. of Ginstar with higher rates of Finish for defoliation and boll opening.

Harvade: Harvade provides effective defoliation of mature plants but is a weak inhibitor of regrowth. Harvade is less temperature-sensitive than phosphate defoliant and is reported to have better activity at lower temperatures. In combinations with ethephon, it can desiccate several weed species including morning glory and prickly sida but exhibits little activity on emerged juvenile growth. The addition of 0.5 to 1 pint per acre of crop oil is necessary for acceptable defoliation.

Aim EC: Aim has excellent activity in desiccation of juvenile growth but does not inhibit regrowth. In well-cutout cotton, and/or cool conditions, Aim activity has been shown to be similar to Def or Folex. In

warm conditions, however, less than desirable defoliation and excessive desiccation have been shown with Aim at higher rates with crop oil concentrate. In situations in which two applications are necessary, Aim has performed very well as the second application. Aim has shown excellent activity in desiccating morning glories. Coverage is essential for optimum desiccation of weeds. In situations with thick vines, Aim alone or in combination with other defoliant will desiccate morning glories very well. Aim can be tankmixed with any of the other defoliant. The addition of an adjuvant is required and the Aim EC label recommends a non-ionic surfactant to be used in warmer conditions and crop oil concentrate to be used in cooler conditions. Limited research in Tennessee has suggested that the addition of 0.25% v/v of a non-ionic surfactant will decrease the likelihood of desiccation compared to Aim + crop oil. The recommended use rate is 0.5 to 1.6 oz/acre.

ET: ET is a PPO-inhibitor herbicidal-type defoliant. Activity with ET will be similar to Aim. The ET label allows tankmixing with all other defoliant, although tank mixes with Ginstar are not recommended due to the likelihood of desiccation. ET use rate is 1.5-2 oz. per acre.

Resource: Resource is a PPO-inhibitor herbicidal-type defoliant. Research with Resource as a cotton harvest aid is limited in Louisiana, but preliminary results suggests that it can be tank mixed with ethephon-containing products. Similar to Aim and ET, Resource should provide acceptable second-application defoliation of mature leaves and desiccation of juvenile regrowth. The Resource label suggest the addition of 1-2 pints of COC be added, or a non-ionic surfactant in hotter weather. Use rate is 4-8 oz. in one application and no more than 14 oz. total for the season.

Blizzard: Blizzard is a PPO-inhibitor herbicidal-type defoliant. Experience with Blizzard in Louisiana has been limited. Blizzard is a very active compound with low use rates. Labeled rates range from 0.5 to 0.6 oz. per acre. Blizzard can be tankmixed with ethephon-based products. Similar to other PPO-inhibitor defoliant, Blizzard should be very useful in desiccating juvenile foliage and as a second application prior to harvest. A crop oil concentrate or surfactant should be added to tank mixes containing Blizzard.

Finish: Finish contains ethephon and a synergist that aids in defoliation. Finish is an excellent boll opener and can be a stand-alone product in cooler weather and well-cutout situations. Finish also exhibits a limited level of regrowth control. Finish is generally a faster boll opener than ethephon and can be tankmixed with thidiazuron, phosphate materials or Ginstar. Use rates of Finish should be 21-36 oz/acre applied alone or 21-36 oz/acre when tankmixed with other products.

Glyphosate (many formulations): Glyphosate provides excellent regrowth inhibition of conventional

(non-Roundup Ready) cotton when applied in conjunction with defoliant or ethephon and results in excellent johnsongrass control. Check specific product labels for registrations as a harvest aid.

Sodium Chlorate: Sodium chlorate is most effective in defoliating mature leaves and provides no regrowth inhibition or removal of juvenile growth. At higher rates, it acts as a desiccant, tending to stick cotton leaves. Sodium chlorate may be the best defoliant choice when temperatures are below 55 F. Application should not be made before cotton has 85% or higher open bolls. Sodium chlorate should not be tankmixed with ethephon-containing defoliants for safety reasons.

Boll-Opening Materials

Ethephon (Prep, Super Boll, Boll'd, Ethephon 6): With adequate spray coverage, Prep, Super Boll, Boll'd and Ethephon 6 accelerate the opening of mature bolls but are not labeled as defoliants. Therefore, they should be tankmixed with other defoliants. At low rates, ethephon can enhance the activity of other defoliants. Adequate time should be allowed before harvest for optimum boll-opening effect. CottonQuik and Finish are combinations of ethephon and a synergist to increase defoliation and speed boll opening over ethephon alone.

CottonQuik/FirstPick (ethephon + AMADS): CottonQuik and FirstPick contain the boll opener ethephon and a synergist. It is an excellent boll opener. Acceptable defoliation with CottonQuik or FirstPick alone requires cutout cotton with mature leaves. Therefore, tank mixes with other defoliants are generally recommended. In tank mix combinations, the use rate of CottonQuik or FirstPick should be 1.5-2 qt/acre. CottonQuik and FirstPick also have good defoliation activity, particularly on older leaves. Therefore,

rates of tankmix partners can be reduced when used in combination with CottonQuik or FirstPick.

Finish (ethephon + cyclanilide): Finish contains ethephon and a synergist that aids in defoliation and boll opening. Finish is an excellent boll opener that can be used in combination with other defoliants. Boll opening rates of Finish range from 21-37 oz/acre.

Deciding on whether or not to use a boll opener can be a difficult decision. Ethephon in any form generally enhances the defoliation activity of other products. Ethephon can also speed the days to being harvest-ready, particularly if applied at 60% or less open bolls. Ethephon will not, however, always open every boll. Bolls that are not mature at the time of application have little chance of opening in 12-14 days whether ethephon is used or not. Adequate spray coverage is essential. Therefore, ethephon can be applied with a defoliant or as a second application 3-4 days after a defoliant has been applied to increase spray coverage of targeted bolls. In general, boll openers are of the most value in good-yielding cotton and also as an aid in harvest scheduling. Ethephon-containing products should never be mixed with sodium chlorate for safety reasons.

Paraquat (Gramoxone Max, Gramoxone Super Tres, Gramoxone Inteon): Paraquat at lower rates (3-6 oz./acre) in addition to conventional defoliants may increase defoliation of juvenile growth and stimulate boll opening. It does not, however, inhibit regrowth. Growers are cautioned that higher rates may result in cotton leaf desiccation and "freezing" of closed bolls. It may be used as a spot treatment for weed desiccation and should not be applied at weed desiccation rates before cotton is at least 85% open and preferably after defoliation. There is a 3-day harvest interval following application of paraquat.



Table of Expected Activity of Various Defoliant

Material	Estimated minimum temperature	Expected activity			
		Mature leaves	Juvenile growth	Regrowth prevention	Boll opening
Def/Folex	60°F	Excellent	Fair	Poor	None
Thidiazuron	65°F	Excellent	Excellent	Excellent	None
Harvade	55°F	Excellent	Fair	Poor	None
Ginstar	60°F	Excellent	Excellent	Excellent	None
Aim	55°F	Excellent	Excellent	Poor	None
ET	55°F	Excellent	Excellent	Poor	None
Resource	55°F	Excellent	Excellent	Poor	None
Blizzard	55°F	Excellent	Excellent	Poor	None
Prep/SuperBoll, others	60°F	Fair	Poor	Poor	Excellent
Finish	60°F	Excellent	Poor	Fair	Excellent
CottonQuik/FirstPick	60°F	Excellent	Poor	Poor-Fair	Excellent
Glyphosate	55°F	Fair	Fair	Excellent	None
Sodium Chlorate	55°F	Fair	Fair	Poor	None
Paraquat	55°F	Desiccation	Excellent	Poor	Fair

Spray Coverage

Thorough canopy coverage is essential for acceptable results with all harvest aids. Carrier volume and nozzle selection are the most important factors in obtaining adequate spray coverage. Research in Louisiana and Tennessee has indicated that defoliant activity increases as carrier volume increases. Carrier volumes less than 10 GPA are not recommended, and 15 GPA is suggested. Lower carrier volumes increase the likelihood of needing a second application. While higher carrier volumes are inconvenient, water remains the cheapest thing that you can put in the tank.

The use of drift-reduction nozzles has become widespread in recent years. These nozzles are excellent at controlling drift and placement of any spray solution. However, as droplet sizes become larger, thorough coverage of leaf surfaces within the canopy can decrease. Research in Louisiana and Tennessee has shown decreased defoliant activity with some drift-reducing nozzles when used at low operating pressures and/or low carrier volumes. Flat-fan and hollow cone nozzles provide excellent spray coverage of harvest aids and are recommended for most applications. Always operate calibrated sprayers within the nozzle manufacturer’s guidelines for operating pressure and carrier volume to obtain maximum canopy coverage and minimal off-target movement.

Rotational Crops Restrictions

With increased interest in double-cropping wheat following cotton, some consideration should be given to label restrictions of harvest aids for rotational crops. The following table summarizes harvest aid label restrictions for planting wheat following cotton.

Label Restrictions for Planting Small Grains Following Application as a Harvest Aide in Cotton	
Material	Recrop interval following application for planting small grains
Def/Folex	None
Thidiazuron	14 days
Harvade	6 months
Ginstar	1 month
Leafless	6 months
Aim	None
ET	None
Blizzard	None
Resource	30 days
Prep/SuperBoll, others	30 days
CottonQuik/FirstPick	30 days
Finish	1 month
Glyphosate	None
Sodium Chlorate	None
Paraquat	None

Harvest Aids for Cotton

Product	Active Ingredient	Recommended Rate of Product per acre	Acres treated by 1 gallon or 1 pound product	Remarks
Leaf Defoliation				
Aim EC	carfentrazone-ethyl	0.75 – 1.5 oz	85 – 170	Removal of mature leaves and desiccation of juvenile leaves. Risk of desiccation is less under cooler conditions. Can be used to desiccate morning glories and some other broadleaf weeds. Use an adjuvant according to label directions.
Harvade 5F	dimethipin	1.0 pt	8	Defoliation of mature leaves. Apply with COC. Addition of ethephon increases desiccation of morning glory species.
CottonQuik	ethephon + AMADS	2.0 – 3.0 qt	1.3 – 2	Apply in combination with other defoliant for enhanced defoliation and boll opening.
Finish 6, Finish Pro	ethephon + cyclanilide	1.5 – 2.5 pt	3.2 – 5.3	Use higher rates for defoliation. Can be tankmixed with other defoliant for enhanced boll opening.
Several brands	glyphosate			For non-Roundup Ready cotton only. Use labeled rates for weed control.
ET	pyraflufen-ethyl	1.5 – 2.0 oz	60 – 80	Removal of mature leaves and desiccation of juvenile leaves. Risk of desiccation is less under cooler conditions. Can be used to desiccate morning glories and some other broadleaf weeds. Use an adjuvant according to label directions.
Resource	flumiclorac pentyl-ester	4 – 8 oz	16 – 32	Removal of mature leaves and desiccation of juvenile leaves. Use an adjuvant according to label directions. Apply no more than 14 oz. in one season.
Blizzard	fluthiacet-methyl	0.5 – 0.6 oz	256 – 213	Removal of mature leaves and desiccation of juvenile leaves. Use an adjuvant according to label directions.
Dropp SC Freefall SC Freefall Klean-Pik 50 WSB Thidiazuron 4 SC Thidiazuron 50 WSB	thidiazuron	1.6 – 3.2 oz 1.6 – 3.2 oz 0.05 – 0.20 lb 0.05 – 0.20 lb 1.6 – 3.2 oz 0.05 – 0.20 lb	40 – 80 40 – 80 5 – 20 5 – 20 40 – 80 5 - 20	Apply at least 0.05 ai for regrowth inhibition. Thidiazuron is temperature sensitive; either avoid or use higher rates in cooler conditions.

Harvest Aids for Cotton

Product	Active Ingredient	Recommended Rate of Product per acre	Acres treated by 1 gallon or 1 pound product	Remarks
Ginstar EC Thidiazuron- Diuron SC	thidiazuron + diuron	3 – 12 oz	10 – 40	Defoliation and regrowth inhibition. Higher rates and tankmixes with other products and adjuvants increase likelihood of desiccation.
Def 6 Folex 6 EC	tribufos	1.0 – 2.5 pt	3.2 – 8	Apply alone or in combination with other defoliant. Use higher rates in cooler conditions.
Leaf desiccation				
Gramoxone Max, Gramoxone Tres, Garmaxone Inteon	paraquat	0.7 – 1.3 pt 0.7 – 1.3 pt 1.0 – 2.0 pt	6 – 11 6 – 11 8 – 16	Apply only as a desiccant once cotton has reached at least 85% open. Severe desiccation of green leaves will occur.
Defol 6	sodium chlorate	0.5 – 0.75 gal	1.3 – 2.0	Apply only as a desiccant once cotton has reached at least 85% open. DO NOT mix with ethephon-containing products. DO NOT graze or feed gin waste to livestock.
Boll opening				
Prep Super Boll Boll'd Ethephon 6	ethephon	1.3 – 2.0 pt	4 – 6	Apply in combination with other defoliant to enhance boll opening. Thorough coverage of green bolls is essential.
CottonQuik FirstPick	ethephon + AMADS	2.0 – 3.0 qt	1.3 – 2	Apply in combination with other defoliant for enhanced defoliation and boll opening.
Finish 6, Finish Pro	ethephon + cyclanilide	1.3 – 2.5 pt	3.2 – 6	Use higher rates for defoliation. Can be tankmixed with other defoliant for enhanced boll opening.
Gramoxone Max, Gramoxone Tres Gramoxone Inteon	paraquat	2.1 – 3.3 oz 2.1 – 3.3 oz 3.1 – 5.0 oz	39 – 60 39 – 60 25 – 41	Apply only after cotton has reached at least 85% open. Some “freezing” of closed bolls may result, particularly at higher rates.

Defoliation Decision Guide

This guide can be used in determining the appropriate harvest aid or harvest aid combination for particular situations. Use the key to identify the group of suggested materials that best fit a specific situation. Some of the products are sold under a variety of trade names; refer to the descriptions of specific

materials for alternate brand names. The following should be used only as a guide in determining materials, combinations and rates. Cotton response to these and other harvest aid options always depends on environmental conditions. For some combinations, an adjuvant may be required or suggested on the label. Always read and follow label instructions.

Expected daytime high temperature above 80 degrees F

Regrowth potential is high

Boll opening is needed

Will attempt a once-over defoliation programSEE GROUP 1

Will be a two-step program.....SEE GROUP 2

Boll opening is not needed

Will attempt a once-over defoliation programSEE GROUP 3

Will be a two-step program.....SEE GROUP 4

Regrowth potential is low

Boll opening is needed

Will attempt a once-over defoliation programSEE GROUP 5

Will be a two-step program.....SEE GROUP 6

Boll opening is not needed

Will attempt a once-over defoliation programSEE GROUP 7

Will be a two-step program.....SEE GROUP 8

Expected daytime high temperature lower than 80 degrees F

Boll opening is needed

Will attempt a once-over defoliation program.....SEE GROUP 9

Will be a two-step programSEE GROUP 10

Boll opening is not needed

Will attempt a once-over defoliation program.....SEE GROUP 11

Will be a two-step programSEE GROUP 12

Suggested Harvest Aids and Combinations

GROUP 1 – High temperatures; boll opening; regrowth control; once-over

thidiazuron 0.075 – 0.10 lb ai + ethephon 21 oz

thidiazuron 0.05 – 0.075 lb ai + Def/Folex 0.5 – 1.0 pt + ethephon 21 oz

*thidiazuron 0.05 lb ai + Aim 1.0 oz + Prep 21 oz

thidiazuron 0.05 lb ai + Finish 1.5 pt

thidiazuron 0.05 lb ai + CottonQuik 2.0 qt

Leafless 10 oz + ethephon 21 oz

**Glyphosate 1 lb ai + ethephon 21 oz or Finish 1.5 pt or CottonQuik 2.0 qt

*For desiccation of most broadleaf weeds

**For control of grasses and pigweeds only in non-RR cotton. Weed control may take 14 days.

GROUP 2 – High temperatures; boll opening; regrowth control; two-step programs

thidiazuron 0.075 lb ai + ethephon 21 oz followed by Def/Folex 1.0 pt

thidiazuron 0.05 lb ai + Finish 21 oz followed Def/Folex 1.0 pt or Aim 1.0 oz*

thidiazuron 0.05 lb ai + CottonQuik 2.0 qt followed by Def/Folex 1.0 pt or Aim 1.0 oz*

Leafless 10 oz + ethephon 21 oz followed by Leafless 8 oz

Aim 1.0 oz + ethephon 21 oz or Finish 21 oz or CottonQuik 2.0 qt followed by Aim 1.0 oz*

Def/Folex 12 oz + ethephon 21 oz or Finish 21 oz followed by Aim 1.0 oz*

Finish 1.5 – 2.0 pt followed by Aim 1.0 oz*

CottonQuik 2.0 – 3.0 qt followed by Aim 1.0 oz*

*Addition of Aim or ET at recommended rates will desiccate most broadleaf weed species.

GROUP 3 – High temperatures; regrowth control; once over

thidiazuron 0.075 – 0.10 lb ai (for well-cutout cotton only)

thidiazuron 0.05 – 0.075 lb ai + Def/Folex 0.5 – 1.0 pt

thidiazuron 0.05 – 0.075 lb ai + Aim 1.0 oz*

Leafless 12 oz + Aim 1.0 oz*

Ginstar 5-8 oz

*For desiccation of most broadleaf weeds

GROUP 4 – High temperatures; regrowth control; two-step programs

thidiazuron 0.05 – 0.075 lb ai followed by Def/Folex 0.5-1.0 pt or Aim 1.0 oz*

Def/Folex 0.75 – 1.0 pt followed by Aim 1.0 oz*

Aim 1.0 oz followed by Aim 1.0 oz*

Leafless 12 oz followed by Leafless 8 oz

Leafless 12 oz followed by Aim 1.0 oz*

Ginstar 6 oz followed by Aim 1.0 oz*

*For desiccation of most broadleaf weeds

Suggested Harvest Aids and Combinations

GROUP 5 – High temperatures; low regrowth potential; boll opening; once-over

thidiazuron 0.05 lb ai + Def/Folex 0.5 – 1.0 pt + ethephon 21 oz

thidiazuron 0.05 lb ai + Finish 1.5 pt

thidiazuron 0.05 lb ai + CottonQuik 2.0 qt

Def/Folex 1.0 – 1.5 pt + ethephon 21 oz

Finish 2.0 pt

Finish 21 oz + Def/Folex 0.5 – 1.0 pt or Aim 1.0 oz*

CottonQuik 2.0 qt + Def/Folex 0.5 – 1.0 pt or Aim 1.0 oz*

Leafless 8 oz + Finish 1.3 – 1.5 pt

*For desiccation of most broadleaf weeds

GROUP 6 – High temperatures; low regrowth potential; boll opening; two-step programs

Def/Folex 0.5 – 1.0 pt + ethephon 21 oz followed by Def/Folex 10 – 16 oz or Aim 1.0 oz*

thidiazuron 0.05 lb ai + ethephon 21 oz followed by Def/Folex 10 – 16 oz or Aim 1.0 oz*

Finish 1.3 – 1.5 pt followed by Def/Folex 10 – 16 oz or Aim 1.0 oz*

CottonQuik 2.0 qt followed by Def/Folex 10 – 16 oz or Aim 1.0 oz*

*Addition of Aim or ET at recommended rates will desiccate most broadleaf weed species.

GROUP 7 – High temperatures; low regrowth potential; once over

thidiazuron 0.05 lb ai + Def/Folex 1.0 – 1.5 pt or Aim 1.0 oz*

Def/Folex 1.5 – 2.0 pt

*Addition of Aim or ET at recommended rates will desiccate most broadleaf weed species.

GROUP 8 – High temperatures; low regrowth potential; two-step programs

Def/Folex 12 – 16 oz followed by Def/Folex 12 – 16 oz or Aim 1.0 oz*

Aim 1.0 oz followed by Aim 1.0 oz*

*Addition of Aim or ET at recommended rates will desiccate most broadleaf weed species.

GROUP 9 – Lower temperatures; boll opening; once over

Def/Folex 1.0 – 1.5 pt + ethephon 1.5 pt or Finish 1.3 – 1.5 pt

Finish 1.5 – 2.0 pt

Finish 1.3 – 1.5 pt + Aim 1.0 oz*

CottonQuik 2.0 qt + Def/Folex 1.0 pt

CottonQuik 2.0 qt + Aim 1.0 oz*

Ginstar 6 – 9 oz + ethephon 1.0 pt

Ginstar 6 oz + Finish 1.0 pt

Harvade 8 oz + ethephon 1.5 – 2.0 pt**

*Addition of Aim or ET at recommended rates will desiccate most broadleaf weed species.

**For desiccation of morningglories only

Suggested Harvest Aids and Combinations

GROUP 10 – Lower temperatures; boll opening; two-step programs

Def/Folex 1.0 – 1.5 pt + ethephon 1.5 pt followed by Aim 1.0 oz*

Def/Folex 1.0 pt + Finish 1.3 pt followed by Aim 1.0 oz*

Def/Folex 1.0 pt + CottonQuik 2.0 qt followed by Aim 1.0 oz*

Finish 1.3 – 1.5 pt followed by Aim 1.0 oz*

Finish 1.3 pt followed by Finish 1.0 pt

CottonQuik 2.0 – 3.0 qt followed by Aim 1.0 oz*

Ginstar 6 oz + ethephon 21 oz followed by Aim 1.0 oz*

Ginstar 3 oz + Finish 21 oz followed by Aim 1.0 oz*

Aim 1.0 oz + ethephon 1.5 pt followed by Aim 1.0 oz*

Harvade 1.0 pt + ethephon 1.5 pt followed by Aim 1.0 oz*

*Addition of Aim or ET at recommended rates will desiccate most broadleaf weed species.

GROUP 11 – Lower temperatures; once over

Def/Folex 1.5 – 2.0 pt

Finish 1.3 – 1.5 pt + Def/Folex 1.0 pt or Aim 1.0 oz*

Finish 1.5 – 2.0 pt

CottonQuik 2.0 – 3.0 qt + Aim 1.0 oz*

Ginstar 6-10 oz

Harvade 1.5 pt

*Addition of Aim or ET at recommended rates will desiccate most broadleaf weed species.

GROUP 12 – Lower temperatures; two-step

Def/Folex 1.5 pt followed by Def/Folex 1.5 pt or Aim 1.0 oz*

Aim 1.0 oz followed by Aim 1.0 oz*

Finish 1.5 pt followed by Aim 1.0 oz*

CottonQuik 2.0 qt followed by Aim 1.0 oz*

Ginstar 6 oz followed by Ginstar 6 oz

Ginstar 6 – 9 oz followed by Aim 1.0 oz*

Harvade 1.0 pt followed by Aim 1.0 oz*

Sodium chlorate followed by sodium chlorate

*Addition of Aim or ET at recommended rates will desiccate most broadleaf weed species.



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