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Achieving a Clean Finish

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Crop termination, the time has come. Shut off water to irrigated fields — a task that seemingly goes against one's grain, especially when you have coaxed and coddled your crop from planting through to cutout. Everyone knows, even the best crops must come to an end. In rain-fed areas of the Cotton Belt, growers race against late-summer and fall rains and storms, sometimes hurricanes, to get their crops harvested and to the gin to maintain their yields and quality.

How do you know when best to terminate a crop? In some areas of the Cotton Belt, cold weather and frosts terminate and defoliate crops — a grower can do little to change Mother Nature. To preserve the quality and yield you have strived for all season, some general guidelines apply across the Cotton Belt. Here we discuss achieving a clean finish through timely termination of irrigation and application of harvest aids.

Why Defoliate?

Once a crop is mature, removing its leaves facilitates mechanical harvesting. Defoliation with harvest aids causes leaves to shed earlier than normal and reduces the trash taken to the gin (Figure 1). Less cleaning of fiber minimizes damage and maintains quality. Without chemical applications, cotton sheds its mature leaves as a natural part of senescence (aging). During the growing season, occasional leaf shed occurs in response to drought, disease, nutrient imbalance, frost, or some other environmental stress. Cotton, like most plants with an indeterminate growth habit, forms new leaves as it grows. Consequently, even after cutout when most of the bolls are open, there are enough green leaves to interfere with mechanical harvesting — hence, the need to defoliate.

When Best to Defoliate?

Cotton plants defoliate most easily when leaves are senescing and a uniform boll load has naturally slowed vegetative growth, a stage of development referred to as cutout. When the nodes above the first position white flower are five or less, a field is nearing or has reached cutout. Timing the last furrow irrigation around cutout allows adequate moisture to mature the upper bolls, but not so much soil moisture to cause new vegetative regrowth or contribute to boll rot. Producers using pressurized irrigation systems (sprinklers, drip) can more finely match their crop's water usage with its needs for boll maturation.

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Optimally timing crop termination to achieve a clean finish can be difficult. The potential for weather-induced yield and quality loss in the oldest bolls needs to be balanced against any additional fiber gain that can be accrued in the top (youngest) bolls. Several useful techniques help to determine when best to apply harvest aids and still retain maximum yield and quality. These include percent open boll, the sharp knife technique and nodes above cracked boll (NACB).

Distinguishing which green bolls will be harvestable is an important skill needed to use these techniques. Not all unopen bolls on a plant will be harvestable at defoliation time. Characteristics of mature harvestable bolls include that they:

* are too hard to depress between thumb and forefinger
* are too hard to slice easily with a sharp knife
* have lint that 'strings out' when bolls are sliced with a sharp knife
* have seeds with coats that are dark yellow to tan in color
* have seed kernels completely filling cavity with no gelatinous material present.

Figure 1. Cleanly-defoliated field. (Photo: K. Lege)

Percent open boll. Percent open boll, an old technique, calls for defoliants to be applied when 60 to 75% of the bolls are open and for desiccants when 80% or more are open and green bolls are crackable when squeezed (Figure 2). To calculate percent open boll, count the number of open bolls and total harvestable bolls per plant on 3 feet of row at four randomly selected areas of a field. Divide the number of open bolls by the number of total harvestable bolls, and multiply by 100. *It is very important to distinguish which green bolls are harvestable!* Although this is still a useful gauge that is used widely on most harvest-aid chemical labels, more accurate techniques are available now.

Sharp knife technique. Cutting into green bolls with a sharp knife is a good way to assess maturity — just be careful. Inspect seeds in cross sections of sliced bolls for signs of immaturity. Jelly surrounding a seed, glistening water in the boll, white cotyledons (instead of yellow-green), and white seed coat (instead of tan or brown) are signs of imma-

Figure 2. Cracked boll. (Photo: K. Hake)

turity (Figure 3). To train your eye, pull a plant with five or more first position bolls set above a cracked boll. Slice open every boll. Bolls set one and two nodes above the cracked boll will be fully matured. The boll three nodes above the cracked boll will be mature by the time a harvest aid takes effect. A boll four nodes above will be less mature, and so on up the main stem.

Figure 3. Sliced bolls showing increasing maturity, left to right. (Photo: C.E. Snipes)

Nodes above cracked boll technique (NACB). This technique allows growers to determine when their fields are safe to treat with harvest aids and still reach 98 to 100% of the yield potential. In the case of a producer who needs to defoliate early, NACB helps determine the amount of yield given up by making an application.

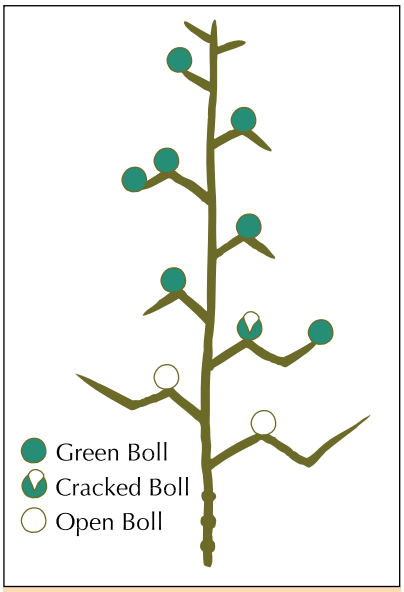

Figure 4. Plant at NACB=5. (Source: K.E. Lege)

To use NACB, examine 20 plants per average-sized field. Take five plants per four randomly-selected sites per field. On each plant, locate the highest first position cracked boll, count the node of that fruiting branch on which the boll is located as "0," then count the number of nodes up to the fruiting branch that has the highest *harvestable* green boll. NACB equals five in the plant shown (Figure 4).

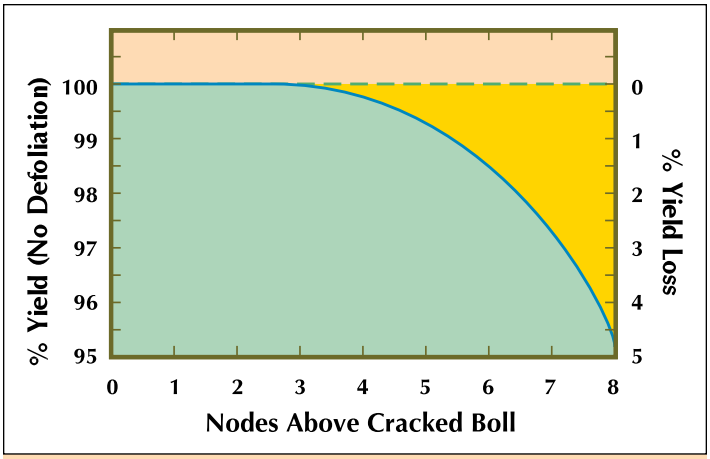

Figure 5. Yield loss from premature defoliation in CA, TX, OK, MS. (Source: T. Kerby)

Defoliating cotton crops at NACB less than or equal to four results in less than a 1% total yield loss (Figure 5). Defoliating at this stage of plant development does not reduce fiber quality (Figure 6). However, defoliating when NACB is greater than four introduces immature fibers from some younger bolls.

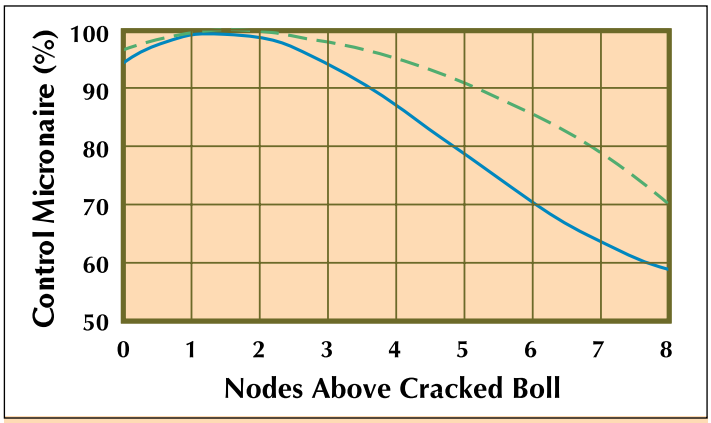

Figure 6. Micronaire as percent of peak value (100%) for harvesting (—-) and defoliating (- - -) cotton of different NACB in four locations (CA, TX, OK, and MS). (Source: T. Kerby)

Although both percent open bolls and NACB are useful in timing applications of defoliants, NACB is often more informative on uniformly-fruited crops. For example, the plant in Figure 7 represents cotton with distinct bottom and top crops. This pattern likely resulted from growing a more indeterminate variety which was hit by a mid-season

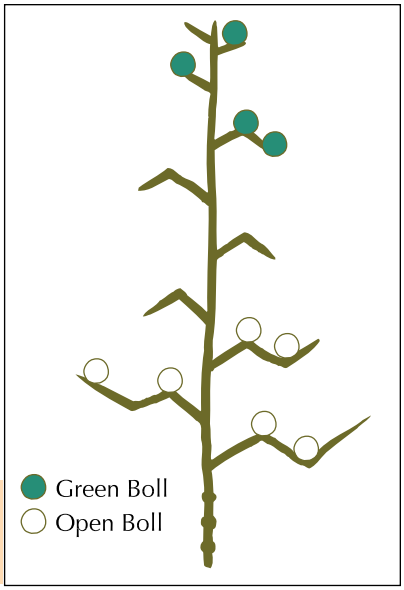

Figure 7. Plant not ready to defoliate, NACB=6, 60% open. (Source: K.E. Lege)

drought. Although the crop has 60% open boll, NACB equals six, which means it is too early to apply harvest aids. Defoliating this plant now would reduce both yield and micronaire as a result of introducing immature fibers from the uppermost bolls.

An early-maturing variety or a crop that had premature cutout may produce a tighter fruiting habit (Figure 8). This schematic represents a field at 44% open boll, usually an indication that it is too early to defoliate. However, NACB equals three, indicating it is advisable to defoliate the crop. Waiting until this field reaches 60 to 75% open boll likely would reduce both yield and fiber quality as a result of weathering of the lower, open bolls.

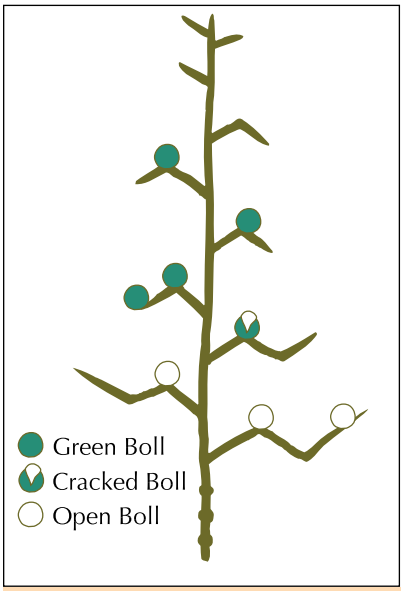

Figure 8. Plant ready for defoliation, NACB = 3, 44% open. (Source: K.E. Lege)

In many instances, it may be advisable and necessary to use all three techniques to make the correct decision, especially in crops with 'abnormal' fruiting patterns due to drought, insect damage, or other factors.

Harvest Aids

Harvest aids are chemicals applied to terminate a cotton crop. They open bolls, defoliate, or desiccate. Harvest aids by category and their availability for use by region of the Cotton Belt are listed in Table 1.

Defoliant applications are most effective in late afternoon or early morning, when humidity is high and winds are calm. Nighttime temperatures 60° F or higher facilitate activity. Plant response to defoliants is driven by heat — the lower the number of heat units, the less activity of the harvest aid in the plant. Generally, if weather conditions are favorable for cotton to grow, they are good for harvest aid activity.

The specific harvest aid and amount of material to use are determined by the condition of the crop, the harvest schedule, and weather factors. The best way to choose a material is to know the strengths and weaknesses of current defoliants and to tailor a program to maximize strengths and minimize weaknesses. Whereas most defoliants perform well under ideal conditions when applied alone at recommended rates, tank mixes of two defoliants applied at one-half the standard rate often cover more needs than one product alone (e.g. provide a combination of good defoliation and some regrowth suppression).

Adjuvants are not required for all harvest aids to perform adequately. However, crop oil concentrate is recommended for Harvade or any combination including Harvade. A nonionic surfactant should be included when Cyclone or Starfire is used. A crop oil concentrate with Dropp and ammonium sulfate increases absorption of Dropp into the leaf. Under conditions favorable for Dropp activity, rates of Dropp can be reduced when applied in this combination. Check the label to determine if an adjuvant is recommended.

Contact-type defoliants like Def/Folex and Harvade slowly injure the leaf. The elicited wound response triggers ethylene production and, ultimately, leaf drop. The same response is seen when plants are stressed from drought, waterlogging, disease, insect injury, or mechanical wounding.

Hormonal-type defoliants include Dropp and Ethephon. Ethephon, once absorbed into the leaf tissue, is converted to ethylene. Dropp acts like a hormone and stimulates ethylene production. Both of these defoliants cause leaf drop without injuring the leaf, an advantage in avoiding sticking desiccated leaves. Check with your local extension office for specific advice as to what works best in your area.

Fine-Tuning Crop Management for a Clean Finish

A timely coordination of defoliation with harvesting capabilities ensures the highest crop quality and yields. Varying planting dates and growing varieties of different maturity classes can help to distribute defoliation and harvesting activities over a wider window of time. Even the best-laid plans are subject to the vagaries of nature, however. Events throughout the growing season affect the performance of defoliants and boll openers.

Drought during a crop's development, an inescapable quirk of nature in many rain-fed regions of the Cotton Belt, makes defoliation difficult. Drought-stressed plants produce a thicker waxy cuticle on the surface of their leaves. Thicker cuticles are harder to penetrate with harvest aids. Adding oil-based surfactants to the spray mixture will improve the effectiveness of some harvest aids under these circumstances.

Harvest Aid	Active Ingredient	Exceptions
Boll Openers		
Ethephon®	Ethephon	
Prep®	Ethephon	
SuperBoll®	Ethephon	
Defoliants		
Accelerate®	Endothall	
Cotton Aid®	Cacodylic acid	
Cotton Quik®	Aminomethanamide dihydrogen tetraoxosulfate, Ethephon	W
Def®	Tributyl phosphorotrithioate	
Defol-6®	Sodium chlorate	
Dropp®	Thidiazuron	
Folex®	Tributyl phosphorotrithioate	
Ginstar®	Thidiazuron, Diuron	SE
Harvade®	Dimethipin	
Quick Pick®	Sodium cacodylate, Cacodylic acid	
Roundup®	Glyphosate	
Desiccants		
Accelerate®	Endothall	
Cyclone®	Paraquat dichloride	W, Mid-S, SE
Quick Pick®	Sodium cacodylate, Cacodylic acid	SE
Sodium Chlorate	Sodium chlorate	
Starfire®	Paraquat dichloride	

Table 1. Harvest aids and their active ingredients. Products are registered throughout the Cotton Belt except where noted.

Ideally, the crop should be out of nitrogen and water at defoliation time. Too much of either makes crops more difficult to defoliate, and may cause regrowth to occur before harvest. Regrowth on the plant at harvest can stain lint which lowers grades and results in discounts. When moisture from abundant regrowth is present in seed cotton stored in modules, it can cause heating and, in the most extreme cases, fire.

Defoliating the crop before it matures can cause problems. The source of nourishment for developing bolls is removed when leaves drop. Smaller boll size and underdeveloped lint and seed could be the consequences. Because defoliation season in many parts of the Cotton Belt coincides with hurricane season, an early defoliation can mean the difference between saving and losing a crop. A crop with leaves intact weathers a storm better than one in which the leaves have been removed. In these regions, growers are advised to defoliate only the acreage they can harvest promptly.

The most damaging effect of defoliating too early involves the use of boll openers. Typically, boll openers are tank-mixed with defoliants to facilitate a once-over harvest. Applying boll openers too early can depress yields and may possibly open bolls prematurely and cause more low micronaire cotton in the bale. Sometimes the defoliant material will 'freeze' what could have been harvestable bolls, again reducing yields.

Regional Perspectives

No two regions of the Cotton Belt have the same weather patterns, soils, pest problems, cotton varieties, or crop termination practices. Here we discuss, region by region, the highlights and any pitfalls associated with terminating a cotton crop and achieving a clean finish.

West (AZ, CA)

The West's hot, arid climate dictates that all its cotton acreage be irrigated. By having greater control of soil moisture and residual nitrogen through scientific scheduling of the crop's final irrigation, growers in this region have some advantages in preparing their crops for defoliation and harvest. The low desert areas of Arizona and California's Imperial Valley experience a monsoon period typified by elevated humidity during late July and into August. Following this humid period, temperatures usually remain above 80° F well into October.

Figure 9. Harvesting experimental plots in the Imperial Valley with a spindle picker. (Photo: A. Wrona)

Because harvest in this region is with spindle pickers, defoliation practices play an important pre-harvest role (Figure 9). Although similar materials are used in Arizona and California, there are differences in labeled rates for harvest aid materials. Combinations of materials and application methods vary from farm to farm. Normal defoliation usually requires two applications. A pre-treatment of ethephon, or ethephon in combination with a phosphate defoliant (Def/Folex), is often followed by a cleanup application. Sodium chlorate in combination with additives like paraquat and cacodylic acid is used extensively for these cleanup desiccant applications. Ginstar, a recently registered defoliant, is providing the highest percent defoliation from a single application.

Research results from defoliation trials have shown clearly that rate adjustments are necessary for adequate defoliation within the production areas of this region. Treatments that produced 80% or greater leaf drop in Arizona and the Imperial Valley only will defoliate 30% or less in the San Joaquin Valley. One cause of this difference is the *Verticillium* wilt-tolerant Acala varieties which are grown in the San Joaquin and not in the southern deserts. The wilt-tolerant Acala varieties were affected much less by two applications of sodium chlorate than varieties lacking this tolerance in field trials conducted at the University of California West Side Research and Extension Center.

Western cotton growers are becoming more comfortable with monitoring techniques for determining when to apply pre-harvest defoliations. The NACB technique has been a very useful method of scheduling defoliation and harvest schedules to avoid harvest and quality loss.

Southwest (NM, OK, TX)

Figure 10. Stripper harvesting High Plains cotton. (Photo: K. Hake)

Achieving a clean finished product. The dominance of stripper harvesting sets this region apart from others (Figure 10). Approximately 80% of the cotton in the Southwest is stripper harvested. Stripping is a season-long process, with the machinery being only one component. Integral to successful stripping are variety selection, management of plant size, irrigation termination, leaf drop, boll opening, plant desiccation, field cleaning with bur extractors, and ginning. Stripper harvesting is highly cost effective when properly instituted. Superior fiber quality — over 1 million bales of high-quality Acala cotton — has been produced in the Southwest every year since the first widespread use of harvest aids in 1993.

In most instances, preparation of cotton for spindle picking requires only a single application of a defoliant, defoliant combination, or Prep plus defoliant. In irrigated river bottoms, two harvest aid applications may be needed. The first conditions the crop and the second completes defoliation.

In the southern, central and north central regions of Texas, cotton is typically prepared for stripping by first applying a defoliant at 60 to 70% open boll or 3 to 4 NACB. Subsequently, it is treated with a desiccant to dry the remaining leaves and some of the stem materials. Sometimes it is possible to strip the crop following only the defoliation treatment, if 95% or more of the leaves are removed. When yield potentials are limited, growers may elect to use only a desiccant to prepare the crop for harvest.

The harvest aid material or materials of choice are determined largely by the location, or more specifically, the nighttime temperatures. In the Lower Rio Grande Valley and along the Texas coast, Dropp is the most used defoliant and provides good leaf drop and some regrowth suppression. Its effectiveness is determined in part by the relatively high night time temperatures common to this region. In contrast, Dropp is not as effective in the north central part of the state because of cooler temperatures there. In that area, the phosphates (Def or Folex) or mixtures of Prep plus the phosphates are more effective. Ginstar, on the other hand, is less sensitive to temperature and has provided good defoliation throughout the Southwest.

Most labelled harvest aid materials are used for specific applications in the Southwest. For example, Harvade, usually in combination with another defoliant, may be used in some fields to both defoliate cotton and dry down annual morning glories. When regrowth is expected to be a problem (e.g. in areas that were subjected to drought and subsequently received sufficient rainfall to promote new growth), the application of Roundup at 30 to 50% open boll, about 7 to 10 days prior to defoliation, is effective for a month or more. Dropp or Ginstar will defoliate most juvenile leaves and provide some regrowth suppression. Accelerate and Quick Pick are used in tank mixtures to enhance activity of other harvest aid products.

In the High Plains, harvest aids are customized for yield, plant condition and weather. For very low yields, the traditional approach of letting cold weather prepare the crop for stripping is used. However, some producers who leave the crop for a killing freeze will apply a harvest aid prior to that time in hopes of initiating leaf drop or boll opening before a hard freeze sticks the leaves and freezes bolls shut by killing the abscission zones.

For moderate to high yields of a half bale or more, low-cost harvest aid strategies bring a crop safely into the gin prior to loss from weathering and its associated quality decline. Because of the short stature of Southwest cotton plants in relation to their yield, fields have very high lint-to-leaf ratios and receive excellent leaf and color grades.

Work on the High Plains has shown that no grade differences are observed with defoliation levels ranging from nearly 100% down to 80% in compact, high-yielding fields under dry harvest conditions. Under these conditions, producers are able to use lower-cost harvest aid strategies that may desiccate some leaves, but still recover excellent grades following moduling and ginning with two stages of lint cleaning. Careful crop preparation for natural leaf senescence and adjustment of desiccant rate allows producers to use low cost desiccants to both defoliate and desiccate plants for stripping.

Time-of-day system for paraquat. Buried deep in the plant physiology literature are comments that paraquat herbicides are more active when applied in the evening. In 1994 this concept was tested on the High Plains and validated in 1995 at several locations across Texas. This research showed the desiccation activity of paraquat (Cyclone, Starfire) is greatly increased if applied under low light conditions which are followed the next day by bright sunlight. The leaf drop activity of paraquat does not appear to be altered in a consistent manner (Figure 11). Perhaps because the paraquat molecule requires light energy for its action, under high light conditions it may work too quickly. Whereas, applications under low light limit the immediate action of the molecule and allow for greater uptake and redistribution in the leaf before the sunlight activates it the next day. For the most cost-effective desiccation and partial regrowth control with paraquat, apply the material in late afternoon or evening before a bright, sunny day.

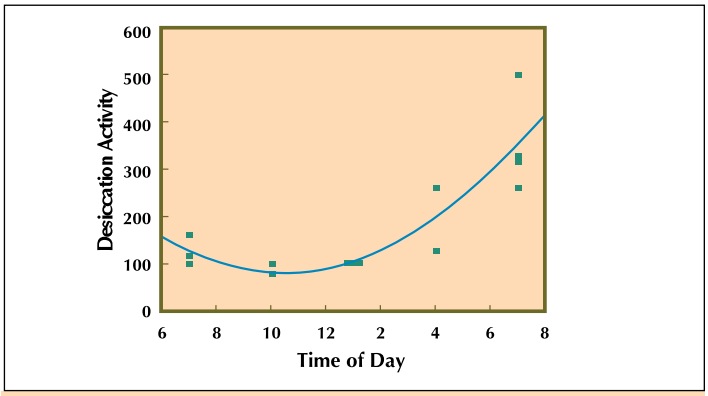

Figure 11. Desiccation activity of paraquat as a function of time of day. (Source: K. Hake)

Growers in northern areas push hard to get all the cotton fiber development they can prior to colder weather in the fall. Weather records in Oklahoma show that the first freeze normally occurs the first week of November and that heat units needed for fiber development markedly decrease the last two weeks in October. A hard freeze can lock immature bolls shut so they cannot open under any conditions (Figure 12). Many growers wait for freezing temperatures to desiccate their mature cotton and prepare it for stripper harvest.

Figure 12. Leaves desiccated and bolls locked shut by early freeze. (Photo: J.C. Banks)

An application of a boll opener before a freeze will cause abscission layers to form, leaves to drop, and bolls to open. Applying harvest aids to an actively growing plant is crucial to its success. Warm weather after the middle of October, preferably one or two days prior to application, provides a window of opportunity that makes the plant receptive to uptake of the boll opener. Continued warm temperatures for the next two days following application improve translocation of the harvest aid.

Mid-South (AR, LA, MO, MS, TN)

In the Mid-South, waiting for full maturity and any associated gains in yield must be balanced against the need for timely harvest and escaping weather-related losses from bolls already open in the field. The number of days per week suitable for field work decreases as the harvest season progresses (Figure 13). This shortened time for field work is a major motivation to use chemical termination.

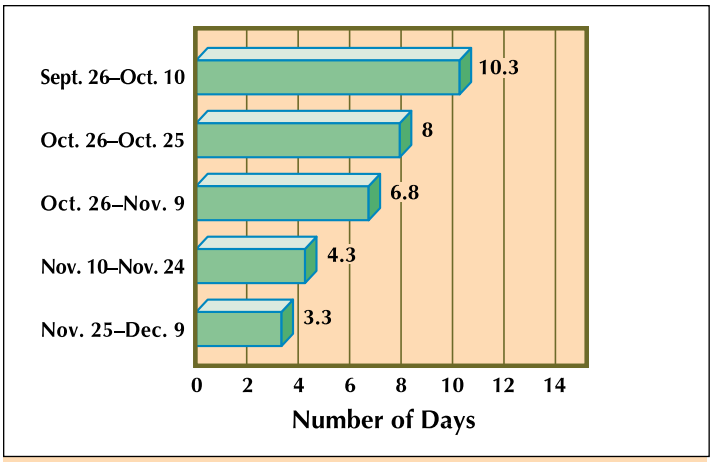

Figure 13. Suitable days for field work during Mid-South harvest. (Source: F. Cooke)

Harvest schedule. Under ideal conditions in the Mid-South, harvest aids typically reach their full effectiveness in 10 to 14 days. To accommodate harvest scheduling and changing environmental conditions, applications made early in the season should be tailored differently than those in late season. Temperatures and days suitable for field work become more limiting as the fall progresses. Initiating harvest before the crop is physiologically mature is often justified where there is large acreage with limited 'picker power.' A four-row picker operating 9 hours a day with modules and boll buggies can harvest 40 acres per day.

In the Mid-South, the following questions are usually considered when tailoring a defoliation program:

* *Is regrowth inhibition necessary?*

  Dropp is the only defoliant considered to be a regrowth inhibitor.

* *Is accelerated boll opening desirable?*

  Several formulations of ethephon are available and should be included in combination with a defoliant if a once-over harvest is desirable.

* *Is weed desiccation necessary?*

  Harvade, Roundup, Starfire and sodium chlorate provide various levels of weed desiccation. Combinations of Harvade with or without Roundup perform well and provide desirable defoliation, especially when ethephon is included. Starfire and/or sodium chlorate provide weed desiccation, especially when applied 5 to 7 days after an initial defoliation.

* *Is rainfall expected within 6 to 24 hours?*

  Folex/Def are the only rain-fast defoliants available. Reasonable defoliation can be expected with Folex/Def or combinations including Folex or Def, even if an unexpected rain occurs within 6 hours of application.

* *Is the nighttime temperature forecast below 60° F for the next 3 days?*

  Harvade or Folex/Def are the preferred choices when temperatures start to fall. Either material performs well under warmer conditions. Both are exceptional under cool conditions relative to other available materials. Harvade plus ethephon or Folex/Def plus ethephon are possible choices to consider when temperatures fall below 60° F.

* *Is a second treatment expected?*

  Give it your best shot the first time, chances are you can do an adequate job. If not, follow the first defoliant treatment with sodium chlorate and Starfire, Folex/Def, or ethephon, depending on the level of defoliation or boll opening desired after initial application.

Southeast (AL, FL, GA, NC, SC, VA)

Achieving a clean finish in the Southeast starts up front with good season-long weed control. No one wants to deal with a weedy cotton field at defoliation time. In most cases, weed control must be maintained for at least 10 weeks after the crop emerges before its canopy shades the bare ground. In some cases, good weed control is essential until the middle of August.

Early-planted cotton may be ready to defoliate as early as the first week of September. Temperatures in the southern tier of the Southeast during early September are usually in the high 80's to low 90's. Defoliants work well under warm conditions, so they generally bring better results in this window of time than when they are applied a month later.

When to terminate a crop is influenced by interacting factors including the season's weather, plant variety, and insect control during fruiting. Much of the acreage in this region is planted in Bt cotton this year. Growing conditions have been good with plenty of rain. The Bt varieties have higher fruit set than historically seen on regular cotton, so this year's crop likely will mature more quickly than in previous years.

Determining crop maturity and timing harvest aid application. In the Southeast, a crop matures in an average of 150 days (ranges from 135 to 170 days). Following a crop's development during the season will help in projecting when it will be mature. This information will be useful in scheduling harvest aid applications.

Gaps in fruiting (i.e. missing positions) require growers to decide what part of the cotton plant to target for defoliation. For example, in late September if 50% of the potential yield is open on the bottom third of the plant and the other 50% represents unopened bolls in the top third, a decision to wait for the top bolls to mature is wise. However, if it is mid-October and young bolls in the top of the plant need another month to mature, the decision to defoliate and pick what is open makes sense. The gray area in between these two extremes is where a person can lose sleep in trying to make a decision.

The Southeast is fortunate to have a number of materials and effective tank mixes available that work well in a variety of environmental conditions. Tank mixtures of ethephon plus Def/Folex, Dropp, or Harvade have performed well throughout the region.

In cases where boll opening is required, where young growth is present at application, and where regrowth is anticipated as a result of too high a tissue nitrogen level or moisture content, a tank mixture of ethephon plus Dropp plus Def/Folex performs extremely well, as long as nighttime temperatures do not fall below 60° F. Desiccants like paraquat should only be used if weed desiccation is needed prior to harvest, or when regrowth control or suppression has failed with other materials. Green tissue harvested with seed cotton stains lint and results in discounts.

Potential pitfalls. In many years in the Southeast, fields have distinct bottom and top crops, usually the result of mid-season drought or severe insect infestation. The temptation is to defoliate too early and harvest only the bottom crop. A second harvest gleans the significantly smaller top crop. The end result is that whereas the bottom crop was salvaged before weathering degraded the lint, the second harvest was not cost effective.

First harvest picker costs range around $45 to $50 an acre. The cost may go up for second harvests which often yield less cotton. In a second harvest the spindles may hit a lot of bare area such as stems, burs, etc. that were left from the first harvest. This extra wear and tear on the picker is difficult to put a price tag on. The bottom line is — be certain your crop warrants a second harvest before that expensive second trip across the field is made.

The time between defoliation and harvest can present another problem for growers in the Southeast. Bad weather can delay harvest of an otherwise mature, defoliated crop. Sometimes harvest is delayed in hopes that bolls at the terminal of the plant mature. In fact, some of these bolls will not receive enough heat units to reach maturity. Meanwhile, early-set and mature bolls are exposed to weather and lose lint.

Insufficient harvesting capacity may present a problem if all fields are ready at the same time. Avoiding this problem begins at planting time. Varying planting dates and growing varieties with different maturities spreads the risk to drought as well as to defoliation and harvesting operations.

Conclusions

Achieving a clean finish is the goal of producers across the Cotton Belt. Ways to go about it vary region by region. Universally, effective timing of harvest aid applications based on percent open boll, NACB or boll maturity is critical to the preservation of crop yield and quality. Good spray coverage and the use of recommended adjuvants as specified on product labels are important to optimize chemical effectiveness.

What's in the Research Pipeline?

Work to identify genes controlling abscission is underway. A better understanding of what affects leaf drop could result in a transgenic cotton engineered to drop its leaves at the appropriate time. Speculation? Yes. Reality? Not yet.

Several companies are developing materials with potential use as harvest aids. Others are working on pre-mixed combinations of products to improve cost-effectiveness. Dropp Ultra, a mixture of Dropp and diuron, is being evaluated for use in the Southeast and Mid-South. Activated ethephon (Finish and other products) will be registered soon.

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