

HARVEST AID DECISIONS

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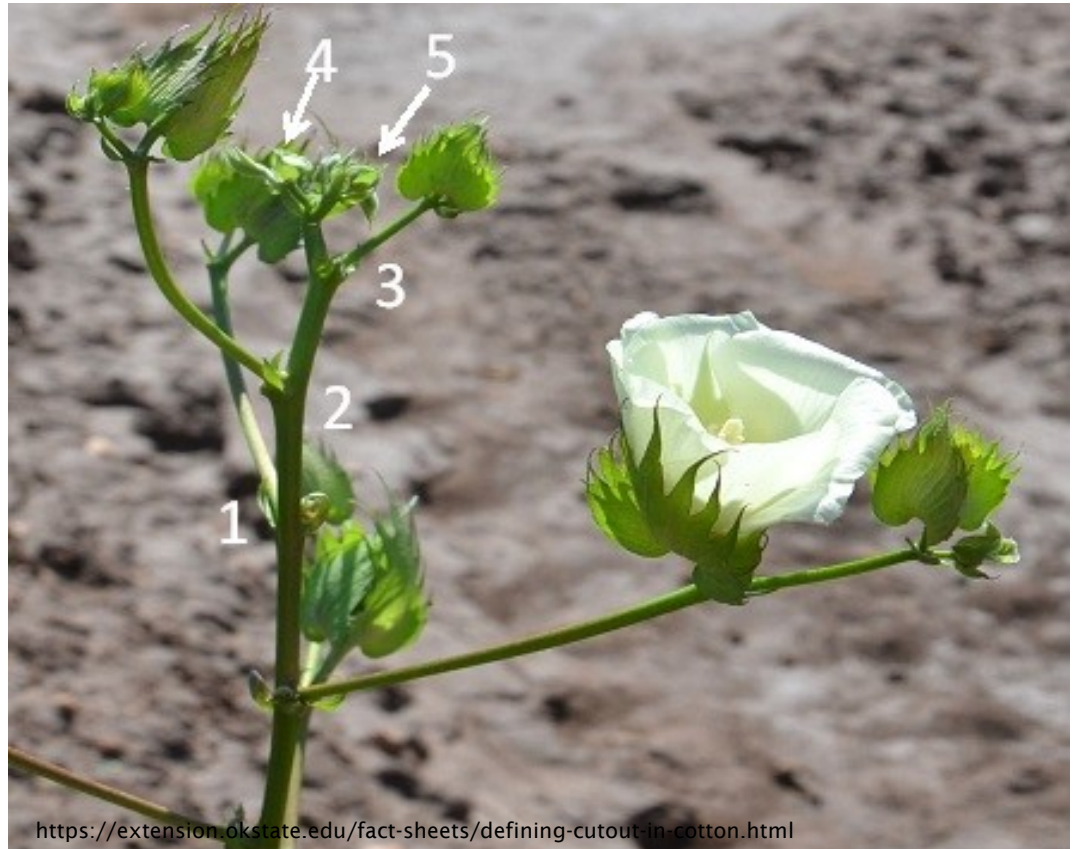
Cotton is an indeterminate perennial

- Cotton will naturally defoliate
 - Let this natural process work for you
 - Manage water and nitrogen
- Use harvest aids to
 - Achieve timely harvest
 - Maintain cotton quality
- Harvest aids do not enhance fiber maturity
 - Timing is key

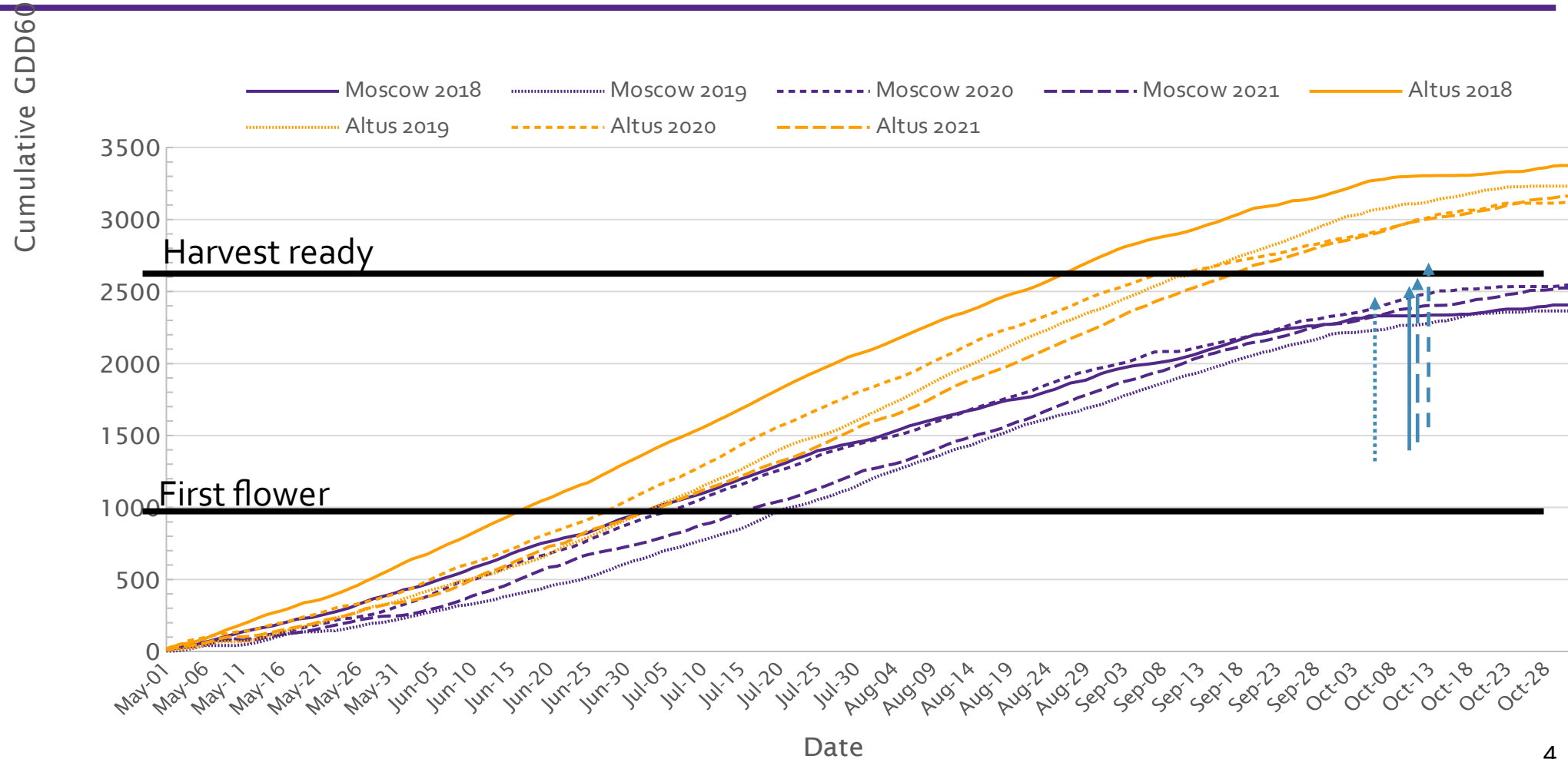


Factors influencing harvest aid timing

- Defoliation easiest after cutout
- Stresses that cause square/boll drop
 - Insect damage
 - Weed competition
- Water
- Temperature

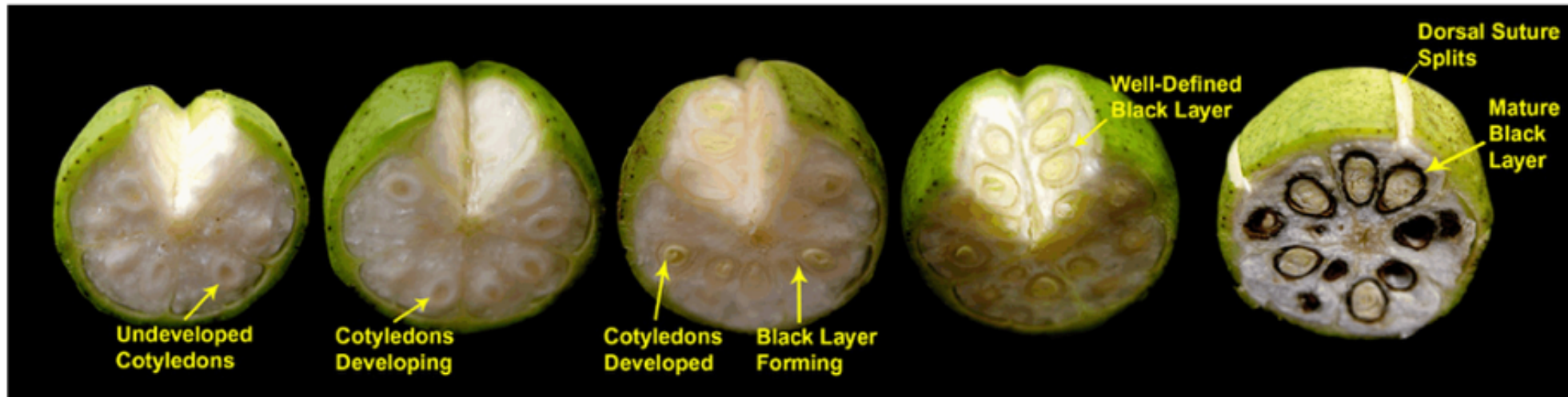


Finishing the KS crop is a challenge



Cut boll technique

- Upper most harvestable boll
 - Firm when pressed and difficult to slice
 - Fibers string out when sliced
 - Seed coat light brown
 - Seed has folded cotyledons and no jelly



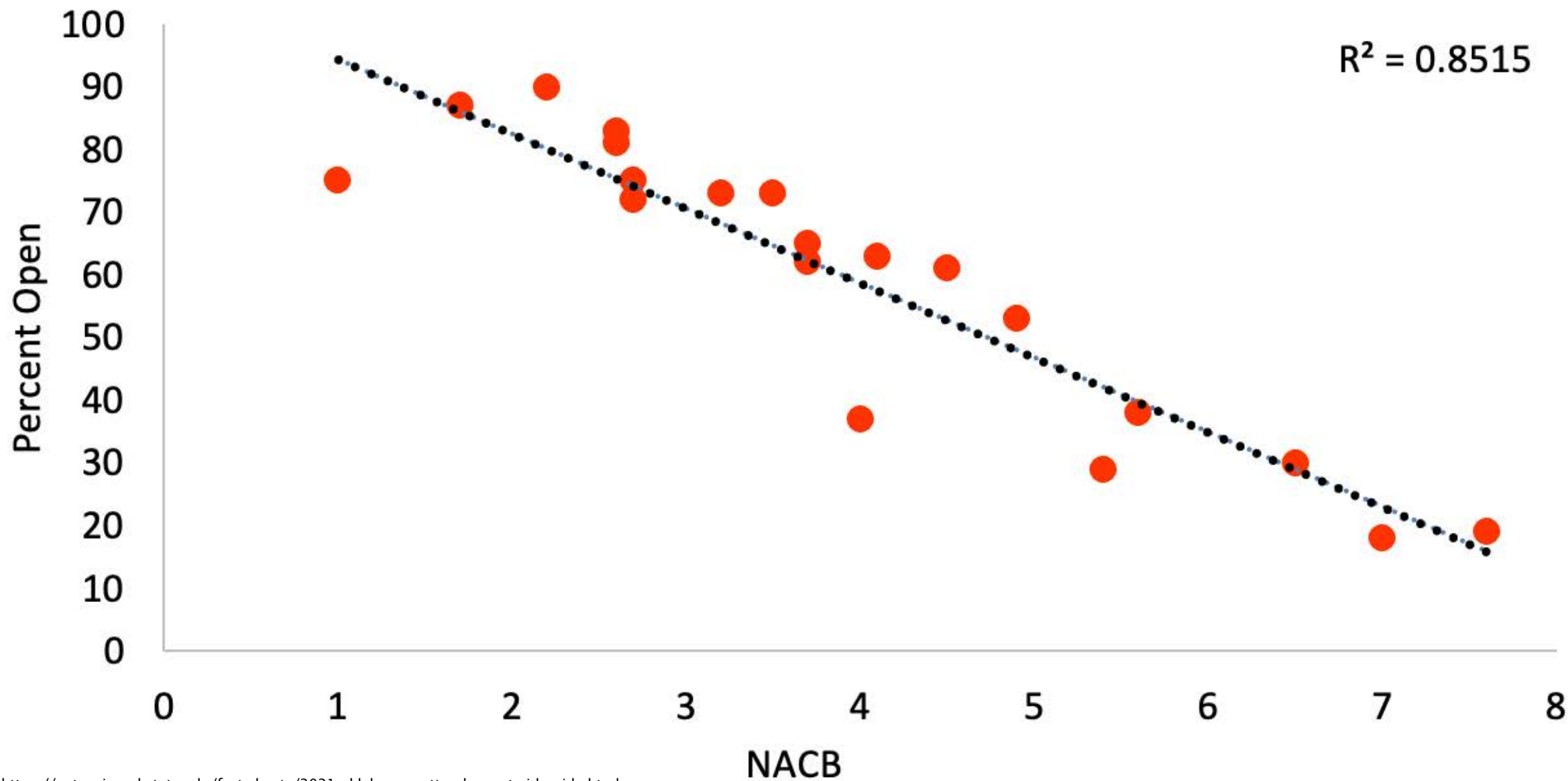
Percent open boll

- 60 to 75% of harvestable bolls open
- May not work well if fruit set over a long period of time or if gap
 - Optimal timing likely to be delayed of most fruit above gap

Node above cracked boll

- 3 to 4 nodes between lowest first-position cracked boll and highest node with a harvestable boll
- May not work well if more bolls on outer positions or vegetative branches


NACB & Percent Open Oklahoma 2019-2020



Kinds of harvest aids

- Boll openers
 - Ethephon
- Defoliants cause leaf drop – NOT sticking
 - Herbicides
 - PGRs
- Desiccant causes rapid moisture loss
 - Often cause leaf stick
 - Paraquat

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 **2021 Oklahoma Cotton Harvest Aid Guide**

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Harvest aids in cotton are used to remove foliage, inhibit regrowth and open bolls to allow for timely harvest operations to maximize yield and minimize quality losses due to weathering. Defoliation and boll opening are natural processes governed by plant hormones, and harvest aids are used to accelerate these naturally occurring processes. The timing of harvest aid applications is primarily governed by crop maturity, but environmental conditions, the products used and rates applied also play a role. This report will cover methods for scheduling harvest aid applications; types of cotton harvest aid products available; considerations for products that can be used; results of previous harvest aid product evaluations and current research; and finally tables on specific products, considerations and rate recommendations for various crop conditions.

The timing of harvest-aid applications should be made on a field-by-field basis, as no two fields experience identical growing conditions season-long. Harvest aids can hasten the natural process of defoliation and boll opening, but they do not influence boll (or fiber) maturity. Boll maturity can be determined by slicing the boll horizontally to expose the developing lint and seeds. A mature boll should be firm and difficult to slice, with mature seeds (fully developed cotyledons with little liquid or "jelly" in the seeds) with a dark seed coat and the lint stringing-out when the two halves are separated. Occasionally there can be a "fruiting gap" due to environmental or insect stress that results in several consecutive nodes of aborted fruit. This can occur on bottom, middle or upper nodes of the plant depending on the timing of the stress. When this occurs, it can give a skewed representation of the maturity of the field.

Recommendations regarding the timing of applications are based on crop maturity status and there are various methods used to determine this status. The most common recommendations are to time applications when: 1. the uppermost first position harvestable boll is four mainstem nodes above the uppermost first position cracked boll (4 NACB; Figure 1) or; 2. 60% to 75% of the harvestable bolls on the plant are open (60% to 75% open bolls). Recent research in Oklahoma has

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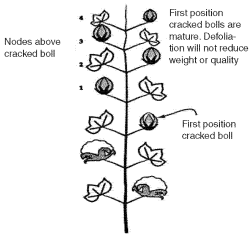


Figure 1. Determining nodes above crack boll. Source: Guthrie, D., Colthren, T., and Snipes, C. 1993. The Art and Science of Defoliation. Cotton Physiology Today Volume 4, No. 7, National Cotton Council, Cordova, TN.

illustrated there is a close relationship between NACB and percentage of open bolls, and that 60% open occurs around the 4 NACB mark (Figure 2). However, in situations where a fruiting gap may be observed due to environmental stress or insect pests resulting in fruit shed, this correlation may not exist. Further, differences in fruit distribution between varieties and maturity classes also will impact this relationship. Therefore, it is recommended to use a combination of the two methods to accurately determine crop condition. Due to in-field variability, it is recommended to evaluate multiple areas of each field and take into account the status of the majority of the plants prior to scheduling a harvest aid application. Both NACB and percent open measurements should be based only on the harvestable bolls on the plants, so only harvestable bolls should be counted. Harvestable bolls consist of bolls that are currently open, mature but not yet open or far enough along

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Defoliants

Product	Active ingredient	Rate	Comments
Folex	tribufos	6 to 16 oz	>10 GPA
ETX	pyraflufen	0.9 to 1.7 oz	20 to 30 GPA
Aim, others	carfentrazone	1 to 1.6 oz	Use COC
Display	carfentrazone & fluthiacet	0.5 to 1 oz	<80F use COC ; >80F use NIS
Resource, others	flumiclorac	6 to 8 oz	Not labeled in KS
Sharpen	saflufenacil	1 to 2 oz	Use MSO and AMS
Freefall, others	thidiazuron	1.6 to 6.4 oz	Can use COC
Ginstar, others	thidiazuron + diuron		10 to 25 GPA

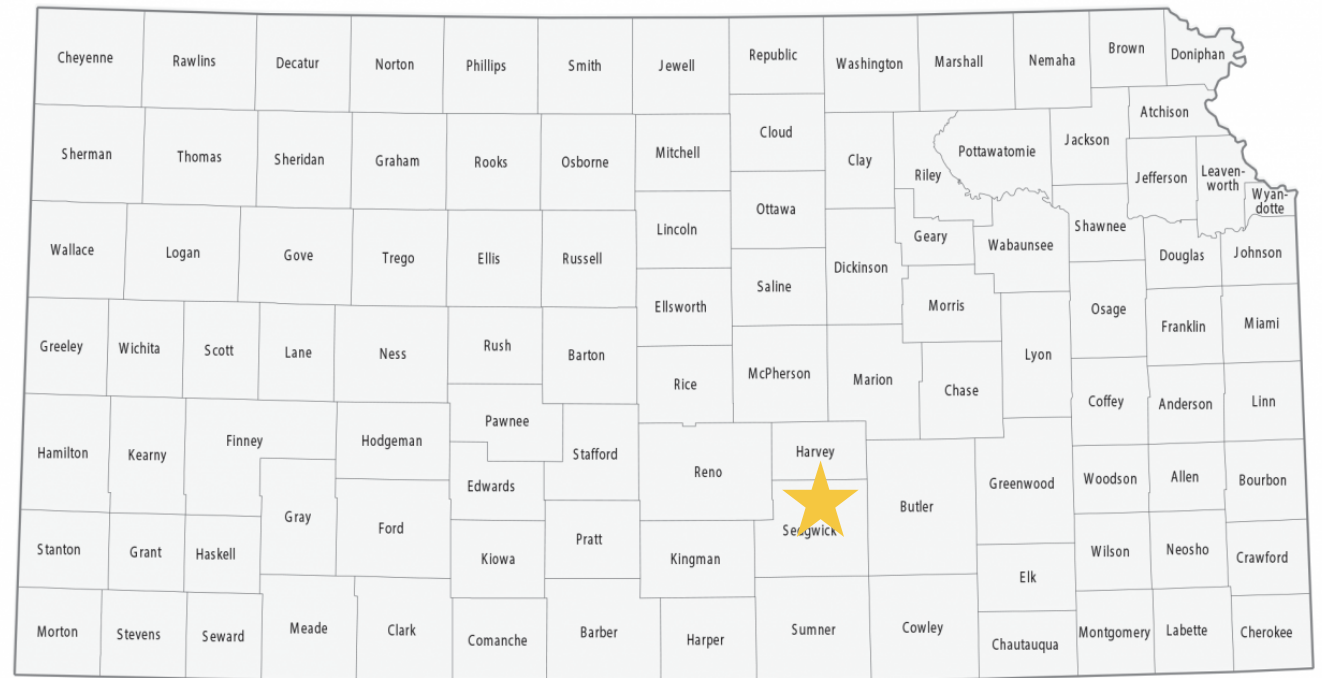
Coverage is key

- Use recommended GPA
- Medium droplets
- Slow ground speed



Harvest aid evaluations in KS

- On-farm near Sedgwick KS
- Plots 10 by 30 feet long
 - 4 replications
- October 1, 2021
 - 20% open boll
 - Temp 74/56
- Treatments applied with a CO₂-pressurized backpack sprayer
 - 15 GPA
 - 11002 Turbo TeeJet tips

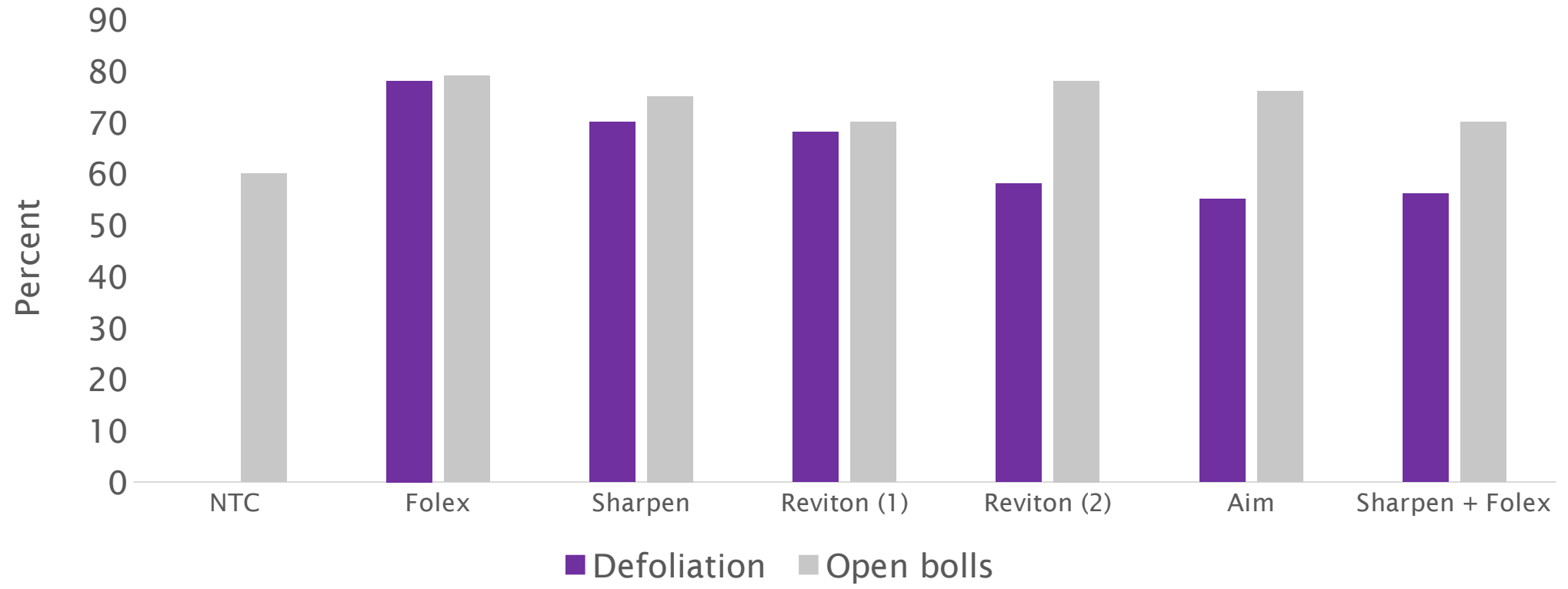


Harvest aid evaluations in KS

1. Nontreated check
2. Folex (1 pt) + COC (1%)
3. Sharpen (1 fl oz) + MSO (1%) + N-Pak (2.5%)
4. Reviton (1 fl oz) + MSO (1%)
5. Reviton (2 fl oz) + MSO (1%)
6. Aim (1 fl oz) + COC (1%)
7. Sharpen (1 fl oz) + Folex (1 pt) + MSO (1%) + N-Pak (2.5%)

All treatments included Prep (32 fl oz)

14 DAT



Weather affects performance

- Reduce defoliant and/or surfactant rate in high temperatures to prevent leaf stick
- Adjust boll opener according to temperature

COTTON							
PRODUCTS USED	WEATHER CONDITIONS	RATE OF APPLICATION		ONE GALLON TREATS	SPRAY VOLUME		TIMING
		PT/A	LB AI	ACRES	GROUND	AIR**	
ETHEPHON 6*	80°F or higher, hot and dry	1 ½	1.0	6	10-50	2-5	Test for boll maturity* and when sufficient mature bolls for desired yield are present make application. Bolls open 7 to 14 days earlier when treated.
	75° to 80°F and Dry	2	1.5	4			
	Above 65°F but cool or Rank cotton	2 ¾	2	3			



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