PHOTOGRAPHIC PLATES

ACKNOWLEDGEMENT

The following pages of photographs depict a progression of harvest technology, as well as examples of various factors affecting harvest efficiency. The editors of this Monograph gratefully acknowledge the generosity of Col. Harris Barnes, USMCR (Ret), for supplying many of the photographs. Also contributing photographs (in order of appearance): Delta Research and Extension Center, James Supak, Jerry Duff on behalf of Uniroyal Chemical, Charles Snipes, and T.B. Freeland, Jr.

DELTA RESEARCH AND EXTENSION CENTER

Prior to the development of aqueous sprays, agrichemicals, including harvest aids, were applied with mule-drawn "dusters" that relied on wet foliage to "stick" the active ingredient to the plant.

HARRIS BARNES

Aerial application contributed to the acceptance of harvest aids, with products such as calcium cyanamide, which also was called cyanamid powder, or "Black Annie."

HARRIS BARNES

Mechanical harvesting gained acceptance in the 1940s, beginning with one-row models initially introduced by International Harvester™.

JAMES SUPAK

Experimentation with different machinery was commonplace in the 1950s and 1960s.

HARRIS BARNES

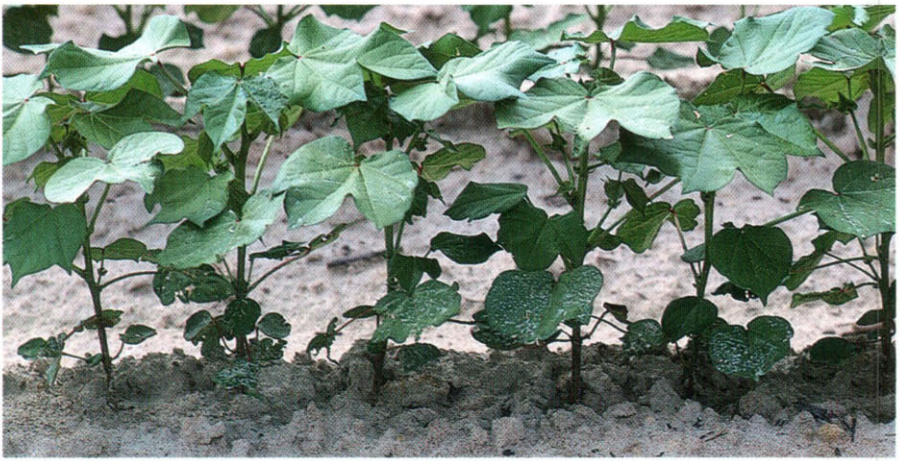
In the 1950s, several manufacturers, such as Allis-Chalmers®, built affordable two-row pickers and strippers.

HARRIS BARNES

Tractor-mounted pickers and strippers provided farmers with affordable mechanical harvesting capability.

JAMES SUPAK

Two-row pickers and strippers dominated the harvest scene for more than 20 years, until manufacturing technology and production economics drove the market to wider, multi-row models.



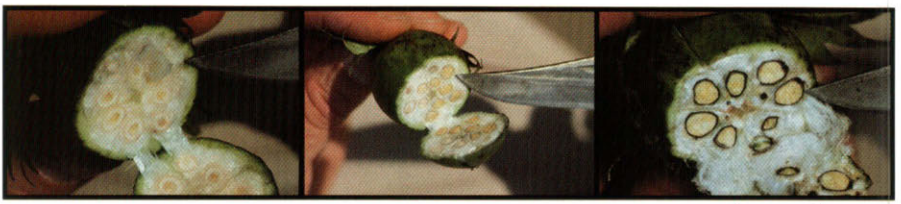
UNIROYAL CHEMICAL

A cost-effective defoliation/desiccation operation in the fall begins in the preceding spring with a uniform stand of healthy seedlings.

UNIROYAL CHEMICAL

UNIROYAL CHEMICAL

Weed management during the growing season is vital to a cost-efficient harvest. Morningglory (*Ipomoea* sp.) is one of the most troublesome weeds that plagues harvest.



UNIROYAL CHEMICAL

Understanding boll maturity is critical to obtaining high-quality lint. Look for back seed coats and well-defined cotyledons to delineate a mature boll from one that is immature.

C.E. SNIPES

JAMES SUPAK

Location of the uppermost cracked boll can be used to determine crop readiness for harvest-aid application with the "nodes above cracked boll" method. Research has shown that four first-position bolls above the uppermost cracked boll are safe to defoliate.

(Inset) A mature boll is considered cracked if lint can be seen through the sutures.

HARRIS BARNES

Basal regrowth is the first to form and hardest to control, but generally is less troublesome to a harvest operation.

UNIROYAL CHEMICAL

The new leaves subsequent to defoliation can appear as terminal regrowth and often are a source of green staining, fine leaf trash, and excessive moisture in seed cotton.

UNIROYAL CHEMICAL

Leaves desiccated by a harsh harvest-aid treatment are essential for stripper harvesting, but can increase hard-to-remove trash in spindle- and stripper-harvested seed cotton.

UNIROYAL CHEMICAL

A crop stressed by drought, hot weather, disease, or other factors generally is more difficult to defoliate.

UNIROYAL CHEMICAL

Ground units are widely used for harvest-aid application, especially in smaller fields and near populated areas. Harvest aids are most effective on crops that are physiologically mature, or "cut out," and free of undue stresses.

UNIROYAL CHEMICAL

Choosing the right combination of harvest-aid products for crop and weather conditions can improve the overall defoliation/desiccation operation.

UNIROYAL CHEMICAL

A significant percentage of the U.S. cotton acreage is defoliated with ground-application equipment.

UNIROYAL CHEMICAL

Aerial application of harvest aids allows cotton producers to cover large acreages in a timely manner.

HARRIS BARNES

Turbine-powered aircraft largely have replaced rotary engines. Turboprops carry a larger payload than conventional spray planes and can cover a greater number of acres per day.

JAMES SUPAK

Good defoliation and desiccation allow for timely stripper harvesting.

HARRIS BARNES

Modern cotton pickers have far greater capacity than could be imagined even as recently as 1980. Advances in the use of harvest aids have facilitated development of larger, faster harvesting and ginning equipment.

HARRIS BARNES

Effective defoliation allows a high-capacity harvest, keeping pickers operating efficiently by using "boll buggies" to transport cotton to module builders.

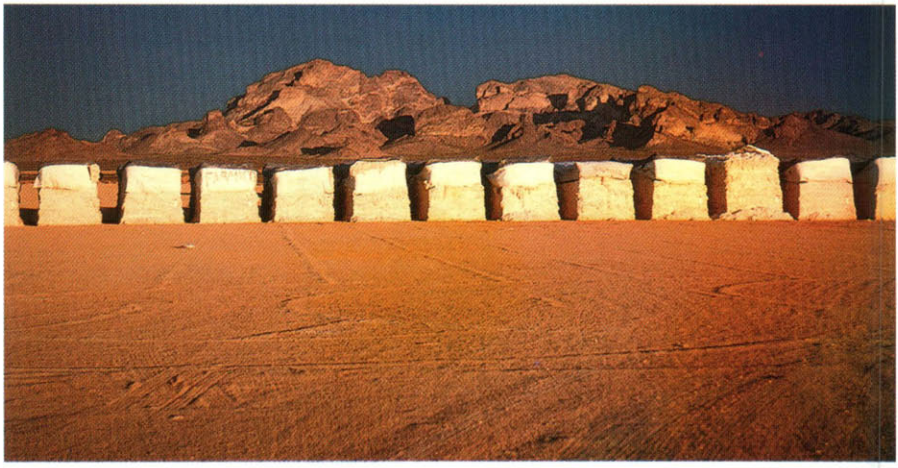
UNIROYAL CHEMICAL

Manufacturing technology meets demand, as growers rush for greater harvest efficiency.

UNIROYAL CHEMICAL

Module building made harvester capacity independent of ginning capacity, enabling growers to get crops "off the stalk" and minimize field weathering losses.

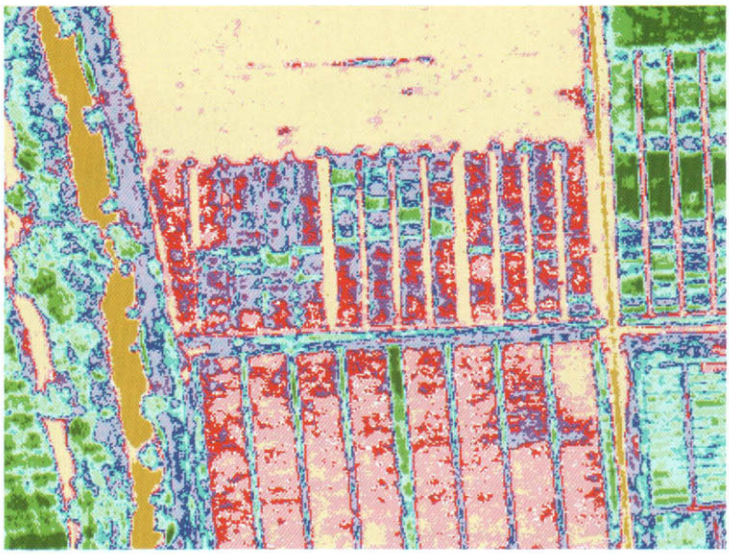
UNIROYAL CHEMICAL



HARRIS BARNES

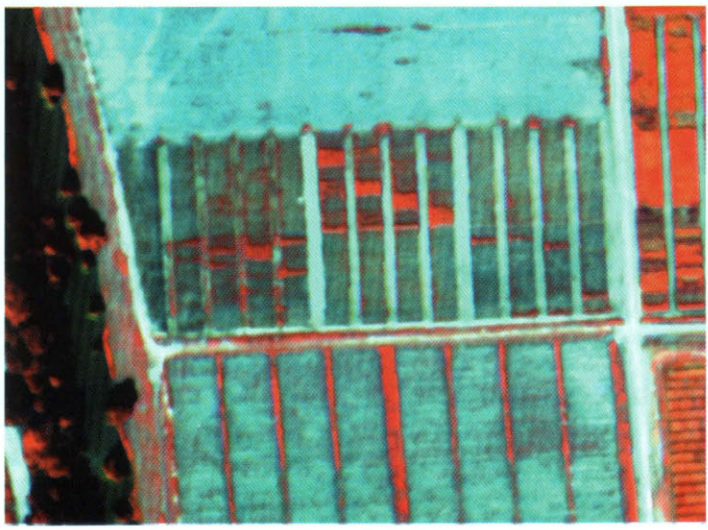
Good defoliation and desiccation, coupled with timely harvest, are important in allowing for safe field storage of seed cotton in a densely packed module.

The images on the following page were processed by T.B. Freeland, Jr., and C.E. Snipes from data provided by Mississippi State University's Remote Sensing Technologies Center and NASA.



MISSISSIPPI STATE UNIVERSITY AND NASA

In the future, precision application of harvest-aid materials will be possible by using remotely sensed data. Classified net vegetative indexing (shown above) indicates areas of full foliage (green) and areas completely defoliated (tan/cream). Decreasing levels of foliage are indicated by blue, followed by purple, then red, then pink.



MISSISSIPPI STATE UNIVERSITY AND NASA

Multi-spectral infrared imaging may be used to identify defoliated (grayish-blue) and non-defoliated (red) areas in a single field.

UNIROYAL CHEMICAL

Harvest-aid programs allow for timely harvest and fit into overall crop management systems, by eliminating food and overwintering sources for insects and by facilitating fall tillage operations.

HARRIS BARNES

Cotton harvest in the new millennium has advanced greatly with the wise use of harvest aids and advances in manufacturing technology.