# EVALUATION OF NEW HERBICIDE CHEMISTRY: DOES KIH-485 HAVE A FIT IN THE SOUTHERN COTTON PRODUCING REGION?

**C.H. Koger**
**Robin Bond**
**D.H. Poston**
**Thomas W. Eubank**
**J.B. Blessitt**
**V.K. Nandula**
**Mississippi State University**
**Stoneville, MS**

## Abstract

Glyphosate has revolutionized weed control in cotton (*Gossypium hirsutum*) in just the past 10 years. The repetitive use of glyphosate and in most cases the sole reliance on this one herbicide has led to development of glyphosate-resistant weeds in many southern cotton producing states. Glyphosate-resistant horseweed (*Conyza canadensis*), Palmer amaranth (*Amaranthus palmeri*), and Italian ryegrass (*Lolium multiflorium*) have been documented in cotton in states across the southern US cotton region. The advent of glyphosate resistance and shifts to weed species that proliferate in a total glyphosate weed control program, such as late-season annual grasses, necessitate inclusion of residual herbicides in a glyphosate-based weed control program. KIH-485 is a new chemistry under investigation for its potential to supplement glyphosate-based weed control programs in the southern US cotton.

Experiments were conducted on or near the Delta Research and Extension Center, Stoneville, MS. Soil type was a Dundee silt loam. Experiments were conducted to evaluate KIH-485 in burndown, preemergence (PRE), or postemergence (POST) programs. Treatments were applied in early March (Burndown), early May (PRE), or to 1-leaf (EPOST), 4-leaf (MPOST), or 6-leaf (LPOST) cotton in the POST trial. KIH-485 was applied at rates ranging from 0.044 to 0.186 lb ai/A. KIH-485 was applied with glyphosate (0.77 lb ae/A) plus dicamba (0.25 lb ae/A) in all burndown treatments. KIH-485 was applied alone in PRE treatments and with glyphosate (0.77 lb ae/A) in all POST treatments. Roundup Ready Flex cotton was planted in late April (burndown trial) to early May (PRE and POST trials). A nonionic surfactant at 0.25% v/v was added to all POST treatments. Treatments were applied with a $CO_2$-propelled backpack sprayer equipped with 11003 flat fan nozzles at a delivery rate of 15 gallons per acre. Weed control and cotton injury was documented throughout the growing season. Weeds evaluated included browntop millet (*Brachiaria ramosa*) in the burndown trial, Palmer amaranth (PRE and POST trials), and barnyardgrass (*Echinochloa crus-galli*) in the burndown, PRE, and POST trials. Data were subjected to the SAS PROC MIXED procedure. Least square means were calculated and mean separation for treatments were produced at $P \leq 0.05$.

Burndown and PRE applications of KIH-485 resulted in no cotton injury. Cotton injury from POST applications of KIH-485 was transient as injury ranged from 13 to 18% by two weeks after treatment when applied to 4-leaf cotton as compared to 0% injury by four weeks after treatment. KIH-485 applied to 1-leaf or 6-leaf cotton resulted in no cotton injury. Browntop millet and barnyardgrass control was as high as 99% by 12 weeks after treatment with burndown and PRE applications of KIH-485. Palmer amaranth and barnyardgrass were controlled 90 to 100% by 4 weeks after treatment with PRE or POST applications of KIH-485. Residual control of small seeded broadleaves and grasses can be excellent with KIH-485. This new chemistry, once registered, can be an excellent residual tool for managing weeds in a glyphosate-based weed control programs and potentially prevent the advent of glyphosate-resistant weeds.