WEED CONTROL RESEARCH IN SUGARCANE

J. L. Griffin, C. A. Jones, and J. D. Siebert
Department of Agronomy

SUGARCANE RESPONSE TO PREEMERGENCE HERBICIDES APPLIED IN SPRING AND AT LAYBY

Significant injury was not observed when LCP 85-384, HoCP 85-845, and HoCP 91-555 were treated with a single application of Valor at 8 oz/A in March or April, or with a single or sequential application of DuPont K4 (a premix of Velpar and Karmex) at 4 lb/A in March or in March and again at layby. In another study when Valor at 8 oz/A was applied with Agridex crop oil concentrate in April or at layby, LCP 85-384 was injured and a reduction in sugarcane and sugar yield was observed. Sugar yield, however, was not negatively affected when Valor at 8 or 12.2 oz/A was applied in March or when DuPont K4 at 4 lb/A was applied in March or April. LCP 85-384 showed excellent tolerance to Envoke (CGA 362622) applied at 0.6 oz/A alone or in combination with Evik. In two layby experiments conducted in St. Martin Parish LCP 85-384 sugarcane was not injured from directed applications of DuPont K4.

REDUCED TILLAGE RESEARCH

Experiments were conducted using LCP 85-384 plant cane and stubble cane in Lafayette, St. James, St. Martin, and St. Mary parishes. Atrazine, DuPont K4, Command plus Direx, or Prowl plus Direx or Sencor was applied in March after cane was either off-barred or not off-barred. Sugarcane shoot populations assessed around four weeks after application were as much as 12% higher where rows were not off-barred. Weed control was excellent in all experiments, but cane injury from Command was observed at some of the locations. At the St. Martin site at layby, soil moisture was higher and sugarcane was taller in plots that had not been off-barred in the spring. In a study at St. Gabriel, soil temperature on the row top within the sugarcane drill in March and April and sugarcane shoot emergence and height were each equal whether or not sugarcane had been off-barred This same response was also reflected in sugar yields. These findings suggest that in fields where rutting is not a problem, tillage operations in the spring could be eliminated without affecting sugarcane emergence, early season tillering, or yield as long as weeds are not a limiting factor.

JOHNSONGRASS CONTROL AND FALLOW WEED RESEARCH

Asulox alone and in combination with Prowl, and Envoke were evaluated for control of 24-inch johnsongrass. By 38 days after treatment, johnsongrass was controlled 70% with Asulox at 4 qt/A, and the addition of Prowl (1 and 4 qt/A) did not enhance control. Johnsongrass control with Envoke (0.3 and 0.6 oz/A) was no more than 35%. Sugarcane was not injured with any of the herbicide treatments. In a fallow area 28 days after treatment, johnsongrass was controlled 71% with Asulox at 3 and 4 qt/A and addition of Prowl at 1, 2, 3, or 4 qt/A did not enhance control. In St. Martin Parish two experiments were conducted in fallowed fields, and excellent

bermudagrass control was obtained with DuPont K4 at 4 lb/A and Sencor at 1.5 and 3 lb/A applied immediately after rows were formed.

RED MORNINGGLORY CONTROL AT LAYBY WITH SOIL-APPLIED HERBICIDES

Spartan was applied at 4, 5.3, 6.7, and 8 oz/A both to the soil surface after Treflan at 2 qt/A had been soil-incorporated and in combination with Treflan as a soil-incorporated treatment to evaluate red morningglory control at layby. At 53 days after treatment, Spartan applied at 8 oz/A and soil-incorporated controlled red morningglory 80%. However, when Treflan was soil-incorporated and Spartan was applied at 4 oz/A to the soil surface, control was 94%. When Spartan was applied to the soil surface and Treflan was not applied, red morningglory was controlled 79% with 6.7 oz/A and 91% with 8 oz/A. Findings clearly show that to maximize red morningglory control, Spartan should not be soil-incorporated and that a Treflan program followed by a surface application of Spartan is superior to that of Spartan applied alone.

SUGARCANE SEED RESPONSE TO 2,4-D AND ALTERNATIVES FOR RED MORNINGGLORY CONTROL

J. D. Siebert, J. L. Griffin, C. A. Jones, and K. A. Gravois
Department of Agronomy and Sugar Research Station

Red morningglory (*Ipomoea coccinea* L.) emerging after the layby cultivation in May can reduce harvest efficiency and sugar yield. To manage this weed, producers often use a late-season aerial application of 2,4-D. This treatment poses no problem if sugarcane is harvested for sugar production, but if stalks are harvested for planting material, bud germination and shoot emergence may be affected.

Field studies conducted over two growing seasons evaluated the effect of 2,4-D applied at 1.5 qt/A (3.8 lb ai/gal) to LCP 85-384 sugarcane 7, 5, 3, and 1 wk before planting. Sugarcane was planted in mid-September using both whole stalk and billet (18 inch) seed pieces. When 2,4-D was applied five weeks or closer to planting, sugarcane shoot emergence and shoot population averaged across planting methods were reduced 5, 7, and 28 weeks after planting (WAP) when compared to the nontreated but stalk counts 52 WAP were not affected. Sugarcane height in one of two years was reduced when 2,4-D was applied five weeks or closer to harvest for seed, regardless of planting method. The first year, sugarcane and sugar yield were reduced 12 to 15% when 2,4-D was applied five weeks or closer to harvest for seed compared with the nontreated but yields were not affected the second year. Since the potential for yield reduction exists, a seven-week period should be allowed between 2,4-D application and harvest of LCP 85-384 for planting material as either whole stalks or billets.

Because of restrictions on use of 2,4-D in sugarcane production areas, alternative herbicides for red morningglory control were evaluated over two years. Complete control of 12- and 24-inch red morningglory was obtained 21 days after treatment (DAT) with 2,4-D at 1 pt/A, Weedmaster at 1 pt/A, Aatrex at 2 qt/A, Valor at 3 oz/A, and Spartan at 6.7 oz/A. Red morningglory 6 feet tall was controlled 100% with 2,4-D at 1 qt/A 28 DAT the first year, but control was only 78% the second year. In the second year when herbicides were applied three weeks earlier than the previous year and when weed growth was more vigorous, red morningglory was controlled 87% with 2,4-D at 1.5 qt/A. Postemergence - directed applications to the lower 18 inches of 6 feet red morningglory plants with Aatrex at 4 qt/A and Spartan at 6.7 oz/A provided at least 96% control the first year, but control was 23 to 30 percentage points less the second year. Several viable options are available to control 24-inch red morningglory in areas where 2,4-D is restricted. When red morningglories begin to climb and wrap sugarcane stalks, control with alternative herbicides is more variable and complete control is difficult to obtain. 2,4-D remains the treatment of choice for late-season control of red morningglory in areas where its use is not restricted.

RED MORNINGGLORY EMERGENCE AND RESPONSE TO SHADE AND TILLAGE

C. A. Jones, J. L. Griffin, and J. D. Siebert
Department of Agronomy

Field studies were conducted in West Baton Rouge Parish, LA, to evaluate red morningglory (*Ipomoea coccinea* L.) emergence and growth in response to shade and tillage. In both studies, plots were tilled with a rotary tiller to a 4-inch depth in May, June, July, and August of each year. Data were collected 20 to 41 days after each tillage operation. In the shade study, shade boxes were used and treatments included 0, 30, 50, 70, or 90% shade. Weed emergence, leaf area, and plant height data were collected just prior to each tillage operation. In the red morningglory tillage study, tilled and non-tilled treatments were included, and initial and final seed population in soil for each treatment were determined each year. Additionally weed emergence 20 to 41 days after each tillage operation was determined. In non-tilled plots Liberty herbicide was used to control weeds in lieu of tillage.

A response in red morningglory emergence to shade was observed in 2001 only for the June sampling date. As shade level increased red morniglory emergence decreased linearly. Under no shade (full sunlight) red morningglory emergence was 13.5 plants/ft^2 and under 90% shade 9.8 plants/ft^2 emerged. At the July, August, and September sampling dates in 2001, shade did not influence weed emergence and emergence ranged from 1.6 to 3.8 plants/ft^2. In full sunlight 3.8, 3.3, 1.8 plants/ft^2 emerged at the July, August, and September sampling dates, respectively.

In 2002, shade influenced red morningglory emergence at the June and July sampling dates. In June, red morningglory emergence under full sunlight was 4.7 plants/ft^2 while increasing shade to 90% decreased emergence by 2 plants/ft^2. In July, red morningglory emergence was reduced from 1.9 for full sunlight to 0.4 plants/ft^2 for 90% shade. At the August and September sampling dates, red morningglory emergence was not influenced by shade and weed emergence ranged from 1.4 to 0.5 plants/ft^2. As noted for the previous year, red morningglory emergence decreased as the season progressed.

Even though red morningglory emergence decreased for some of the sampling dates in response to shading, plant growth (leaf area and height) for individual dates both years was equivalent regardless of shade. The differences in red morningglory growth among sampling dates for the individual shade levels is probably a reflection of soil moisture. Data also indicate that environmental conditions were more conducive to red morningglory growth and development in 2002.

Soil samples collected at a 4-inch depth prior to initiation of the study contained between 100 and 450 red morningglory seeds/ft^2. On the July sampling date red morningglory emergence was equal whether soil was tilled or not tilled around four weeks earlier and emergence averaged 9.7 plants/ft^2. In August, weed emergence was 45% greater when plots had been tilled around four weeks earlier as compared with plots that had not been tilled (9.3 vs 6.4 plants/ft^2). On the

September sampling date, only 2.1 plants/ft^2 emerged in the non-tilled plots compared with 8.0 plants/ft^2 where plots were tilled. The decrease in red morningglory emergence as the season progressed and the greater separation between tillage treatments for the August and September sampling dates are probably caused by soil seed bank depletion. Soil samples taken in October clearly showed a decrease in the seed bank from the initial sampling, but no differences in seed population were noted between tilled and non-tilled treatments. This indicates that tillage redistributed seed in the soil profile and that soil aeration enhanced germination.