

WEED CONTROL RESEARCH WITH LABELED AND NEW HERBICIDES

J. L. Griffin, C. A. Jones, L. M. Etheredge, Jr., and W. E. Judice
Department of Agronomy and Environmental Management

For the 2003 growing season, research was conducted at the St. Gabriel Research Station and in Assumption, Lafayette, Iberia, St. James, St. Martin, St. Mary, and West Baton Rouge parishes.

Sugarcane Response and Weed Control with Herbicides Applied From Planting through Layby

At 90 days after application of herbicides at planting in 2002, bermudagrass was controlled 90 to 93% with Dupont K4 (4 lb/A) and Command (3.33 or 2.67 pt/A) plus Direx and 80% with Command (3.33 pt/A) plus Spartan. Bermudagrass control was only 20 to 40% with Prowl plus Sencor, Prowl plus atrazine, Sencor alone, and Sencor plus Direx. Weed control was impressive considering that on September 25 and October 3, 2002, heavy rainfall was received from two tropical systems, Tropical Storm Isidore and Hurricane Lili.

Two studies were conducted using LCP 85-384 to evaluate injury potential with Dupont K4 (4 lb/A) compared with Direx applied in late March and with Dupont K4 applied sequentially in spring followed by a directed application at layby in late May. Sugarcane and sugar yield were not negatively affected by the herbicide treatments. Another study evaluated sugarcane injury potential with Dupont K4 (4 lb/A), Prowl plus Direx, or atrazine applied postemergence overtop in March, April, or May. For the March application maximum air temperature for the period seven days before and seven days after application ranged from 59° to 81° F with an average of 73.2°. For the April application maximum air temperature for the 15-day period ranged from 78° to 86° with an average of 82.8°. For the May application, maximum air temperature for the 15-day period ranged from 83° to 92° with an average of 88.2°. Significant injury to LCP 85-384 and reduced sugarcane and sugar yield occurred only for the mid-May application of Dupont K4 and Direx. It can be concluded that the response is temperature related and, if temperature at the time of application is around 85°, Dupont K4 or Direx should not be applied over the top of sugarcane.

For Valor applied at 8 oz/A in late March, sugarcane was injured around 30% 21 days after treatment. Injury consisted of reddening of foliage and stunting. Sugarcane was able to recover from the early season injury and, even when Valor was applied at layby following a previous March application, sugarcane growth was not affected negatively. Entire leaf morningglory control 24 days after layby was around 94% for Valor at 4 oz/A compared with 81% for atrazine at 2 qt/A. Differences in sugarcane and sugar yield among treatments were not observed.

In-crop Johnsongrass Control Research

Johnsongrass was controlled 34 days after treatment 33% with Asulox at 2 qt/A and 86% with Asulox at 2 qt/A plus Envoke at 0.3 oz/A. This compares with around 65% for Asulox at 4 qt/A or Envoke at 0.3 oz/A applied alone. Sugarcane injury was no more than 10% where Envoke was applied alone or with Asulox, and height differences among herbicide treatments were not observed. The combination of 2 qt/A Asulox (half rate) plus Envoke provided greater johnsongrass control than 4 qt/A Asulox (full rate) applied alone. In another study, injury to LCP 85-384 following an April application of Envoke was no more than 11% and consisted of stunting and white banding on newly emerging leaves. By 43 days after application, sugarcane height was not affected negatively. Sugarcane and sugar yields were equivalent for the Envoke and the standard treatments.

Red Morningglory Control Research

Red morningglory was controlled 91 to 96% 43 days after soil application at layby of Spartan at 4 to 8 oz/A. Atrazine at 4 qt/A controlled morningglory 76%. For Dupont K4, 4 lb/A controlled morningglory 96% and 3 lb/A provided 88% control, but control was 59% when the rate was reduced to 2 lb/A. Sencor provided no more than 82% morningglory control. Control with Valor was 97% at 8 oz/A, 86% at 6 oz/A, and 76% at 4 oz/A.

Harvest Aid Research

Pitted morningglory with 3- to 4-foot runners was controlled three days after application in August 85 to 90% with Aim at 1, 1.5, and 2 oz/A and around 35% with ET-751 at 0.5 and 1 oz/A. In contrast, red morningglory control was 75 to 80% with the Aim treatments and around 40% with the ET-751 treatments. Indications are that pitted morningglory may be more sensitive than red morningglory to Aim. In standing sugarcane with red morningglory as tall as the crop, weed control 13 days after a September application was 93% with 2,4-D, 73% with Aim at 1.9 oz/A, and 65% with atrazine at 3 qt/A. By 34 days after treatment, red morningglory was controlled 83 to 87% with atrazine at 3 qt/A, Aim at 1.9 oz/A, and Clarity at 16 oz/A compared with 98% with 2,4-D. In contrast the ET-751 treatments and the lower rates of atrazine and Aim controlled red morningglory 33 to 55%.

Note: Specific data and comments for all experiments conducted are presented in the Weed Science 2003 Annual Research Report and can be viewed at www.lsuagcenter.com/weedscience under the category “Weed Science Related Publications.”

EVALUATION OF REDUCED TILLAGE IN PLANT AND STUBBLE SUGARCANE

W. E. Judice, J. L. Griffin, C. A. Jones, L. M. Etheredge, and J. D. Siebert
Department of Agronomy and Environmental Management

In 2002 preliminary studies at three locations in both plant and stubble sugarcane were conducted to evaluate the feasibility of eliminating the off-bar tillage operation. The experimental design was a randomized complete block with a factorial arrangement of treatments. Factor A represented tillage or no tillage in March. Factor B was herbicide treatments, which included Velpar plus Direx (11 oz/A + 2.25 lb/A), Prowl plus Direx (4 qt/A + 2.25 lb/A), Prowl plus Sencor (4 qt/A + 1.5 lb/A), Command plus Direx (2.7 pt/A + 2.25 lb/A), and atrazine (2 qt/A). Results showed that spring herbicide application and reduced tillage were not limiting factors to early-season sugarcane growth, and at one location sugarcane growth was improved by eliminating the off-bar tillage operation.

Experiments were conducted in St. Gabriel, La. in 2002 and 2003 and in Glencoe, La. in 2003 to evaluate the effect of tillage throughout the growing season on weed control and sugarcane growth. Early-season herbicide application method was also evaluated to determine the effect on weed control when tillage was reduced or eliminated. The experimental design was a randomized complete block with a factorial treatment arrangement and four replications. Factor A was off-bar tillage (with or without) and factor B was layby tillage (with or without). Factor C represented early-season herbicide application method (band or broadcast). The sugarcane variety used in the study was 'LCP 85-384,' and the herbicide used in the study was Dupont K4 (4 lb/A). Data collected included soil temperature, shoot and stalk population, plant height, and sugarcane yield and sugar yield. Weed control was not a detriment to sugarcane growth or yield in the three experiments. Soil temperature in the sugarcane drill was not affected by spring tillage. Early-season sugarcane shoot population and late-season stalk population in both years were each equivalent for the full tillage (off-bar plus layby) and the no tillage program. Sugarcane tonnage and sugar yield were not affected negatively when tillage operations were eliminated.

ALTERNATIVE WEED CONTROL PROGRAMS USING REDUCED TILLAGE PRACTICES IN FALLOWED SUGARCANE FIELDS

L. M. Etheredge, Jr., J. L. Griffin, C. A. Jones, and W. E. Judice
Department of Agronomy and Environmental Management

Weed problems, especially the perennial weeds bermudagrass [*Cynodon dactylon* (L.) Pers.] and johnsongrass [*Sorghum halapense* (L.) Pers.], increase in the successive crops and, over time, sugarcane plant populations are reduced to the point that replanting is warranted. Sugarcane fields are then fallowed, and tillage and glyphosate programs are used to reduce weed infestation levels. A study was conducted in Donaldsonville, Louisiana, to evaluate various weed control programs in fallowed sugarcane fields, specifically to compare mechanical destruction of sugarcane stubble followed by tillage, soil-applied herbicide, and/or Roundup UltraMAX applications (conventional programs) with a no-till system where Roundup UltraMAX was used to kill sugarcane stubble. Another similar study was conducted in Henderson, Louisiana, to evaluate only the conventional programs. At planting, at both locations, DuPont K4 (4 lb/A) was applied broadcast across all treatments to evaluate the effects of the various weed control programs implemented during the fallow period.

At the Donaldsonville location, 14 days prior to planting on August 28, weeds were present in all plots, with the population depending on when a tillage or Roundup UltraMAX application was performed. The most important determinant of the effectiveness of the various fallow programs, however, would be the level of weed reinfestation that would occur after sugarcane was planted. One month after planting, as expected, differences in sugarcane shoot emergence were observed, and results showed fewer shoot emergence for the conventional system where only tillage was used or when only tillage and one Roundup UltraMAX application was used. At 50 d after planting (DAP) purple nutsedge (*Cyperus rotundus* L.), bermudagrass, and johnsongrass were controlled 72 to 82% for the no-till programs compared with less than 60% purple nutsedge and bermudagrass control for the conventional programs. These data suggest that a no-till system can be used in fallow fields to manage weeds equal to or better than conventional tillage programs without affecting soil preparation negatively prior to planting or sugarcane stand establishment.

At the Henderson location, bermudagrass present at planting where only tillage operations were performed resulted in some difficulty in opening rows and in covering planted sugarcane stalks. However, sugarcane shoot emergence 36 DAP was not affected negatively by any of the conventional fallow programs. Bermudagrass ground cover 36 and 86 DAP showed that tillage alone provided little control of bermudagrass. Bermudagrass control, however, was excellent where tillage was followed by Roundup UltraMAX 7, 28, or 47 days ahead of planting. Results also show that even though DuPont K4 programs were effective in controlling bermudagrass when used in conjunction with Roundup UltraMAX, they were no more effective than when DuPont K4 was substituted by a tillage operation. However, use of a soil treatment such as DuPont K4 may offer advantages in years when wet soil would prevent field activities.