

Crop Profile for Sugarcane in Louisiana

General Production Information



Louisiana ranks second in the US in both sugarcane acreage and production, with 45% of the US acreage and 37% of the US production. Including fallow land, 550,000 acres are grown by 804 producers with over 393,000 harvested for sugar and 34,000 acres harvested for seed. Thirteen million tons were delivered to the mills from which 1,275 thousand tons of raw sugar were produced in 1998.

The cost of production is approximately \$250 per acre in direct costs. This varies greatly depending on ownership of the land, whether seed cane is purchased or raised as nursery stock, equipment used, pest management practices and many other factors which reduce or increase the total per acre cost.

Production regions

Sugarcane is grown in at least 21 parishes in the south central part of the state, extending from Rapides Parish near the center of the state, south to Lafourche Parish south of New Orleans and west to near Lake Charles in Calcasieu Parish. Climate, soil suitability and nearness to mills limits production to this part of the state.

Cultural Practices

Sugarcane is a member of the grass family and requires fertile, well drained soil and an abundant supply of moisture for successful growth. It has a long growing season that allows it to recover from short duration droughts. Late spring or early autumn freezes can dramatically impact yields and quality. Irrigation is not common in Louisiana but is sometimes carried out on a few farms during prolonged dry periods. In typical years no irrigation is required due to the high rainfall.

The land is prepared for planting with a 15" to 18" flat bottomed furrow or a furrow with a slight ridge of loose soil down the center. Planting furrows are opened down the top of elevated rows or beds. Fertilizers, insecticides and herbicides are sometimes added at this point (see specific pesticides).

Sugarcane is planted beginning in August through October. In some years it is extended into November if necessary. It is recommended that heat treated seed cane be covered with no more than 2" of packed soil. The seed cane should be placed 3-4" above the final water furrow or higher in poorly drained soils to avoid water damage. An application of 15-45-45 lbs/acre of N-P₂O₅-K₂O should be applied in the planter furrow ahead of planting in succession planting systems and is suggested for conventional planting following a fallow season.

This crop is not thinned

There are no significant regional differences except weather differences and soil types that affect the drainage, rooting depth, and soil fertility.

Insect Pests

SUGARCANE BORER, *Diatrea saccharalis*

The sugarcane borer is the major pest of sugarcane. The sugarcane borer is responsible for 90% of the crop losses due to insect damage. Losses in sugarcane yield average 12-15% annually, but can range above 50% if the pest is not kept below economic thresholds. (8)

The sugarcane borer is a crambid species whose larvae tunnel in the stalks of many gramineous plants including, sugarcane, corn, rice, and sorghum in Louisiana. Egg masses are deposited on the sugarcane leaves, newly hatched larvae migrate to the leaf sheath and feed around that area until about half grown. The larvae then bores into the stalk at the internodes and tunnels up and down the stalk. The sugarcane borer completes development inside the stalk then emerges through an exit hole carved earlier by the larvae. There are from five to seven instars. The reduction in stalk weight is the most severe damage, but sugarcane borer also stunts growth, weakens stalks, kills terminal buds and causes suckering, destroys some vegetative buds of seed cane and increases plant susceptibility to pathogens(2).

The sugarcane borer is monitored by visually inspecting the stalks. Economic treatment threshold is reached when 5% of the crop has live larvae feeding in the leaf sheaths on the outside of the stalk.

Controls:

Biological control:

Biological control makes up for 25% of within season suppression of sugarcane borer. Since 1957 the predation from the red imported fire ant Solonopsis wagneri has been a very important predator of the borer and is not treated as a pest by the sugarcane producers. Cotesia flavipes , a larval parasite has been

released and has reached levels as high as 55% parasitism of the sugarcane borer in release sites, which helped suppress the borer population. It has become established in the areas where it has been released. (8).

Chemical control:

Sugarcane is generally treated with insecticide based on the infestation level, effectiveness of resistant varieties and effectiveness of natural enemies. Approximately 45% of the acreage was treated with insecticides. The majority are applied by air.

- **Azinphos-methyl (Guthion 50wp)** 30 days PHI. Approximately 2% of the acres were treated with Guthion at a rate of 18 oz. per acre, applied 1 time. This is still a valuable product under certain conditions in the management system. This product may be used only by permit from Louisiana Department of Agriculture and Forestry.
- **Lambda-cyhalothrin (Karate)** 30 day PHI. Approximately 20% of the acreage was treated with Karate at 0.033 lbs a.i. per acre. This was applied 3 times during the season. This is a highly effective material.
- **Tebufenozide (Confirm 2F)** 30 day PHI. Approximately 72% of the infested acreage was treated with Confirm at 0.094 lbs per acre. It was applied 1-2 times by air at the rate of 6 oz. per acre. This is a high priority, environmentally friendly material. It is very useful in IPM program.
- **Cyfluthrin (Baythroid 2)** 15 day PHI. Baythroid was applied to approximately 4% of the acreage at a rate of 0.033 lbs a.i. per acre.
- **Esfenvalerate (Asana XL)** .66 EC 21days PHI. Asana was applied to 2% of the acreage at the rate of 0.033 lbs/A.

WIREWORMS

When present in the sugarcane field, wireworms can cause a lot of damage and are difficult to control. These insects overwinter in the larval or adult stage in the cane field. The adults emerge in the spring and appear to stay in the same area to lay eggs. The larvae hatch within a few days and the larvae feed on the roots of the plant. Because of the impact some of these chemical controls on non-target and beneficial enhancing problems with the sugarcane borer, use of treatment sampling and wireworm economic thresholds is strongly encouraged (11).

Controls:

Biological control:- None is known

Cultural control:

Crop rotation is not valuable because the wire worms would remain and feed on the roots of the new crop.

Chemical control:

- **Phorate(Thimet 20 G)** 8-10 lbs of formulation per acre. This product is applied at planting. This product provides good control.
- **Carbofuran (Furadan 4 F)** 1 lb/A . This product is used at planting and provides good control.
- **Ethoprop (Mocap 206)** 8-10 lbs of formulation per acre. This product also is applied at planting and provides good control.

Diseases

The following diseases are associated with sugarcane:

white stripe, ratoon-stunting disease red rot, rust, smut, mosaic, and leaf scald.

Cultural control:

All of these diseases are presently managed by using disease resistant varieties. Heat treated seed cane is also a method used to prevent ratoon-stunting disease and smut. Kleentek is seed cane raised from tissue culture and is also used in disease management.

Chemical control:

There are no fungicides applied to this crop.

Weeds

Weed pests of sugarcane are both broadleaves and grasses. However, since sugarcane is a grass crop, grassy weed removal is more difficult than broadleaf weed removal. There are no biological weed controls available. Mechanical weed control in a current sugarcane crop consists of removal and replacement of soil along each side of the row bed (called "off-barring"), to remove and disturb weeds. It should be noted that growers use three years (three harvested crops) as a standard time for one sugarcane

production cycle, prior to placing a production field into one year of fallow.

A cultural weed removal process (shaving) is becoming less used as time goes forward. This was practiced to remove soil, weeds and crop residue from the top of the sugarcane beds and provide a clean band of soil for herbicides prior to herbicide application. Reasons for decrease in this practice include larger farms with proportionally less time to spend at any operation, required extra machinery and evidence that shaving may promote increase in some diseases.

The current and most-practiced mechanical weed control in the spring, prior to herbicide application is "false shaving". This is a process in which crop and weed removal from sugarcane row tops is accomplished with a low-set rotary mower. Herbicides are then banded over the top of the sugarcane row to save amount of herbicide used and provide acceptable weed control.

With the recent introduction and use of the combine sugarcane harvester into Louisiana, and the large amount of crop residue left in the field after harvest, some current weed control research is focusing on modification of herbicide application. Current weed research projects with the combine harvest system are defining herbicide rate modification, effect of crop residue on herbicide activity and weed control and regrowth of sugarcane after dormancy.

Biological control:

There are no biological weed control options available.

Chemical control:

- **Ametryn (Evik)**- A post emergence material used for control of winter broadleaf weeds and summer grasses which can be used in plant cane or stubble crops. There are restrictions after which the material may not be applied (i.e. April 10 or cane >20" in height). May also be used post directed at lay-by. Recommended label practice for one application is 2.5lb Evik per acre + 0.5 ai. 2,4-D amine +1 quart crop oil concentrate. Efficacy is good on browntop panicum, annual grasses, winter and other broadleaf weeds. Efficacy is fair to good on morningglories and winter grasses. Not used much in Louisiana (<0.1% total sugarcane herbicide applied/year) for a total use of about 824 pounds ametryn per year.
- **Asulam (Asulox)**- A post emergence herbicide used primarily for rhizome johnsongrass control and the only herbicide registered for post emergence rhizome johnsongrass control in a growing sugarcane crop. An extremely important herbicide to Louisiana sugarcane production as rhizome johnsongrass can substantially reduce sugar yields. Maximum application rate is 4 quarts per acre twice a year. Efficacy on seedling and rhizome johnsongrass is good which may occasionally range to excellent. For unknown reasons, consistent control of rhizome johnsongrass is erratic even after extensive research. Total use of Asulox in Louisiana is about 247,000 gallons per year.
- **Atrazine (AAtrex 4L, others)**- Used extensively throughout Louisiana sugarcane production

due to low cost and control of broadleaf weeds, primarily annual morningglory species and annual grasses. It is also used to control winter and other summer broadleaf weeds.

Morningglories can interfere with harvest when wound around sugarcane stalks, causing harvesting delays and potential human injury. The harvester operator needs to stop and clean out the harvester, when the harvester becomes inoperable due to jamming with morningglory debris. Used preemergence, post emergence or post emergence directed at layby and often tank-mixed with other herbicides to increase weed spectrum. Most sugarcane acreage is treated with two to three pounds active ingredient per acre per year, for a total use range of 824,450 to 1,236,675 pounds active ingredient per year in Louisiana.

- **Dicamba (Banvel)**- A benzoic acid herbicide used for hard-to-control annual, biennial and perennial broadleaf weeds. Applied post emergence from beginning of weed growth until prior to crop canopy close-in. Application rates range from ½ pint to 4.0 pints product per acre, averaging 1.0 quart per application, depending upon targeted weed species and weed size. Dicamba provides good to excellent control of broadleaves, particularly summer broadleaf weeds, morningglories and winter broadleaf weeds. Total use in Louisiana is about 15,459 gallons per year.
- **Dicamba + 2,4-D (Weedmaster)**- A premix of dicamba and 2,4-D used post emergence to broaden the weed spectrum, compared to dicamba alone. Provides excellent control of many winter and summer broadleaf weeds, particularly morningglories. Generally applied at 1.0 quart of product per application. Removal of winter weeds allows more efficient use of early sugarcane tillage and herbicide application, resulting in increased efficacy of herbicides applied for summer weeds and greater return to the grower. Total use in Louisiana is about 51,528 gallons per year.
- **Diuron (Karmex 80 DF)**- Primarily used a soil applied preemergence herbicide, some diuron is applied in tank-mixes to increase weed burn down and provide residual weed control. When applied to the soil as a preemergence herbicide for control of germinating weeds, application rates vary from 1.0 to 3.0 pounds of product per acre and proportionately less on a band. This herbicide is generally applied on a band just after cane planting or prior to cane or weed emergence in the spring. Provides good to excellent weed control of a variety of sugarcane weeds, including annual grasses, morningglories, winter weeds and summer broadleaf weeds. Diuron also has some efficacy on seedling johnsongrass. Total use in Louisiana is about 573,817 pounds active ingredient per year.
- **Glyphosate (Roundup Ultra, others)**- Primarily used in the fallow year attempting to control all weeds and provide a weed-free seed bed for fall planting. Applied post emergence in the fallow year at one to two quarts product per application, averaging 1.5 applications per fallow year. In this use, glyphosate is viewed as an alternative to tillage for weed control. Glyphosate may be tank-mixed with residual herbicides to extend weed control during the fallow without additional herbicide applications. There is some use under shielded sprayers in the growing sugarcane crop. Provides good to excellent control of most emerged weeds in the fallow year and fair control of bermuda grass when used under a hood in the sugarcane crop. Total use in Louisiana is about

470,000 gallons per year.

- **Metribuzin (Sencor DF, others)**- An extensively utilized soil herbicide applied pre or post emergence due to soil activity and excellent short- term control of seedling johnsongrass (no effect on rhizome johnsongrass) and good to excellent control of annual morningglory species during sugarcane production and the fallow year. When mixed with a surfactant, metribuzin will aid weed control by providing some contact activity to emerged weeds. Applied at 0.75 to 2.0 pounds product per acre, it is often tank-mixed for use at lay-by to extend weed spectrum. Efficacy is also excellent for annual grasses and winter broadleaf weeds. Total use in Louisiana is about 865,673 pounds of 75 DF product per year.
- **Paraquat (Gramoxone Extra)**- A non-selective, post emergence, contact herbicide used in the spring before sugarcane emergence to control most winter weeds, primarily annual ryegrass. It may also be tank-mixed during the spring application with some soil residual herbicides to provide additional burndown and help control germinating weeds prior to spring tillage. Applied most often at 2.0 pints per acre once a year, paraquat provides excellent control of most winter weeds, except wild garlic and wild onion. Total use in Louisiana is about 77,292 gallons product.
- **Pendimethalin (Prowl 3.3EC, others)**- A soil applied herbicide which may or may not be soil incorporated, depending on the weed spectrum. If applied and incorporated, application rates are lower than for preemergence, non-incorporated treatments. Pendimethalin is primarily a grass herbicide, which excels at itchgrass control. Itchgrass is a large, annual weed which can severely limit sugar yields. Pendimethalin is often tank-mixed during many weed control stages of sugarcane production to increase weed spectrum. Efficacy is excellent on seedling johnsongrass and annual grasses while providing good to excellent efficacy of itchgrass and browntop panicum. Total use in Louisiana is about 449,700 gallons of product per year.
- **Terbacil (Sinbar 80WP)**- Sinbar is used primarily as a preemergence herbicide used alone or in a tank-mix which cannot be applied over the top of green sugarcane due to phytotoxicity concerns. Sugarcane varieties have different responses to terbacil: some sugarcane varieties are more sensitive to terbacil than others. Application rate is 1 to 1.25 pounds of product per acre applied after planting in the fall and before sugarcane emerges, with a 1.4 pound product per acre treatment sometimes performed in the spring. The spring treatment is used with caution and the rate sometimes reduced, due to sugarcane phytotoxicity concerns. Use at layby consists of 0.5 pound product per acre applied postemergence directed, sometimes tank-mixed, in the growing crop. This herbicide is used primarily to control seedling johnsongrass and annual broadleaf and grass weeds. Efficacy on seedling johnsongrass is good to excellent if applied immediately after planting, with similar seedling johnsongrass efficacy from a spring application. Terbacil also provides excellent control of annual grasses and winter broadleaf weeds and good to excellent efficacy of morningglories and other broadleaf weeds. Total use in Louisiana is about 298,451 pounds of terbacil.

- **Trifluralin (Treflan HFP, others)**- A dinitroaniline herbicide which must be incorporated into the soil immediately after application, trifluralin is a standard grass herbicide utilized primarily for itchgrass and seedling johnsongrass control. Two applications of 2 to 4 pints product per acre may be made each year: one application is generally made to the plant cane in the fall and the second early in the year (after shaving or false shaving) before or shortly after the sugarcane emerges. Sometimes the second application made at layby and incorporated with a cultivating or off-barring disk. Trifluralin provides excellent control of seedling johnsongrass and annual grasses: itchgrass and browntop panicum control is good to excellent. Total use in Louisiana is about 237,877 gallons of product.
- **2,4-D (Weeder 64, others)**- An amine formulation of 2,4-D and broadleaf herbicide used early in the year preemergence to the sugarcane and post emergence to winter weeds for winter weed removal at 2 pints product per acre. Later in the growing season, the herbicide is used after sugarcane emergence through layby at rates of 1.5 to 2.0 pints product per acre for broadleaf weed control, primarily morningglories. Efficacy on many summer and winter annual broadleaf weeds is good. Total use in Louisiana is about 173,568 gallons of product per year.

NOTES:

1. Efficacy rating scale: Fair = 50 to 69%; Good = 70 to 89%; Excellent = 90 to 100%
2. Total herbicide use is calculated on planted sugarcane acreage of 1997, which is 412,225 acres.
3. "Total use in Louisiana" means total use for sugarcane only in one growing year and are the best estimates, based on experience and what is perceived to be current field practices.

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