

Crop Profile for Sorghum in Texas

Prepared: June 2008

General Production Information

Grain sorghum is planted under dryland and irrigated conditions. In 2007, total acreage harvested under dryland and irrigated conditions was 1.89 million and 565,000, respectively. Dryland areas produced 112.21 million bushels while irrigated areas accounted for 49.49 million bushels.

Commodity Information in 2007:

State Rank: 2

Production: 161.7 million bushels for grain.

Acres Planted: 2.75 million.

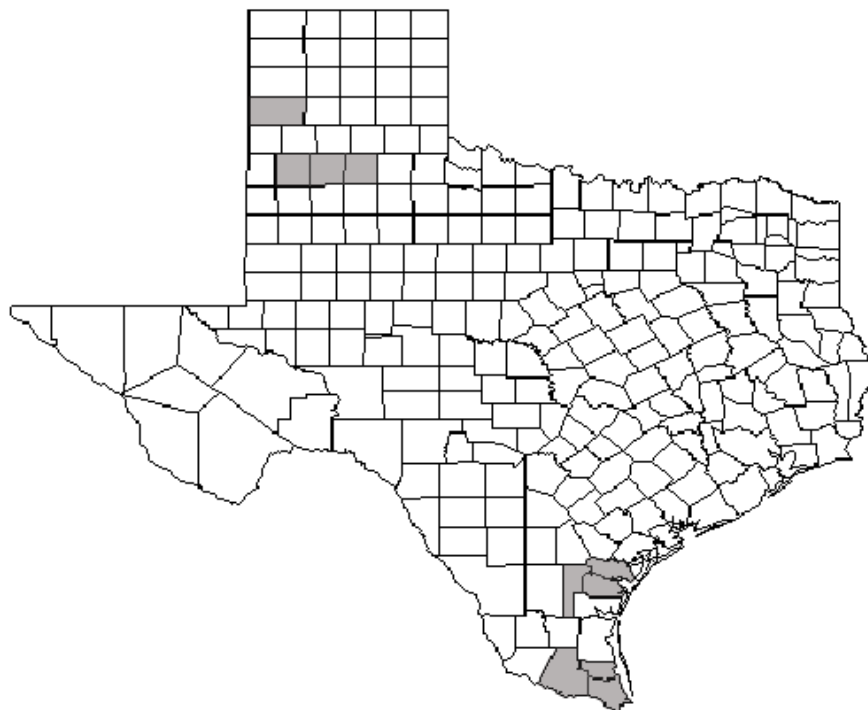
Acres Harvested: 2.45 million for grain and 110,000 for silage.

Yield per Acre: 66 bushels for grain and 20 tons for silage.

Cash Value: \$611 million.

Top 10 sorghum-producing counties (in descending order): Nueces, Hidalgo, Willacy, Cameron, San Patricio, Deaf Smith, Hale, Lamb, Floyd, and Jim Wells (Figure 1). Top-producing regions are Rio Grande Valley, Coastal Bend, and High Plains.

Figure 1. Top ten Texas counties for sorghum production in 2007.



Production Regions

The Coastal Bend, around Corpus Christi, produces 14% of Texas sorghum. This region experiences temperate conditions with very high humidity. In the Coastal Bend approximately 25-32 inches of rainfall is received per year. Top-producing counties include Nueces, San Patricio, and Jim Wells counties.

The Lower Rio Grande Valley (LRGV) is located between McAllen and Brownsville, adjacent to the Mexico border. This region plants early due to the subtropical climate and insect problems. Average rainfall is between 25 and 30 inches per year and this area produces 16% of the state's crop. Top-producing counties include Hidalgo, Willacy, and Cameron counties.

The High Plains region of Texas is located north and south of Lubbock, Texas between the Caprock and the New Mexico border. This area consists of 27 counties that produce 34% of the state's sorghum crop. The hot days and cool nights plus loam and sandy soil types make it vital to implement water and soil conservation methods. Average rainfall is 16-22 inches, but there are wide year to year variations in both total and seasonal rainfall. Top-producing counties include Deaf Smith, Hale, Lamb, and Floyd counties.

The Upper Gulf Coast region is located south and southwest of Houston. This region produces 8% of Texas' sorghum crop. Medium to heavy soils and relatively high rainfall allows this area to consistently produce significant sorghum yields.

The Blacklands of Texas is located south of Dallas. This region produces 9% of the state's total sorghum crop. Deep prairie soils predominate this region. Temperate, warm nights and rainfall of 30-36 inches a year lead to the fact that only five percent of this region is irrigated.

Cultural Practices

Sorghum is well-adapted to Texas, and its ability to yield consistently in harsh environments makes it popular with growers. Grain sorghum is generally grown as an annual crop, although there has been some ratoon production in Texas.

Cultural practices frequently employed in Texas sorghum production cover a wide range of production systems. Tillage systems include conventional tillage, reduced tillage, conservation tillage, strip-till, and no-till. While the majority of grain sorghum is grown in rows with spacings ranging from 27" to 40", some sorghum is planted broadcast. Sorghum may be planted as early as February in the Lower Rio Grande Valley or as late as June in the Plains regions.

Crop rotation is a very important aspect of sorghum production in Texas. The most commonly rotated crop with sorghum is cotton. Other crops rotated with sorghum include corn, soybean, wheat, and peanut. Sorghum-cotton rotation allows growers to

decrease grassy weed competition in sorghum. Similarly, sorghum rotated with herbicide-tolerant corn or soybean also provides sorghum growers opportunities to decrease grassy weed populations in sorghum fields.

Worker Activities

The vast majority of worker activities associated with sorghum production in Texas will involve mechanized operations, therefore, there is very little potential for worker exposure to pesticides. Planting, cultivation, spray application, and harvest are all completed using either tractor or combine. Hand-hoeing is virtually non-existent in sorghum. The only potential for exposure would be during scouting activities or equipment maintenance in the field during a tractor-assisted operation.

Insect Pests

Insect pest problems in sorghum can vary widely across the state, as well as from one season to the next. The insect pests with the greatest potential to decrease yield are the greenbug and the sorghum midge, the latter is particularly important in the southern half of the state. In 2003, twenty percent of sorghum acres in Texas were treated with an insecticide (NASS 2004). Terbufos was the most commonly applied insecticide on about four percent of planted acres. Chlorpyrifos was applied to one percent of sorghum acres in 2003.

Seed and root insect pests

Wireworms

True and false wireworms feed on planted sorghum seed, preventing germination. To a lesser degree, they feed on seedling plant roots, reducing plants stands and vigor.

- **Cultural control:** promote rapid germination, rotate with tap-rooted crop such as cotton
- **Chemical control:** (Name IRAC group)

<u>Seed treatment</u>	-imidacloprid (Gaucho) 4A -thiamethoxam (Cruiser) 4A
<u>At planting</u>	-terbufos (Counter) 1B

Red imported fire ant

Under certain conditions in the eastern and southern parts of the state, red imported fire ants feed on planted seed. They prefer water-soaked or germinating seeds, but also damage dry seeds.

- **Cultural control:** promote rapid germination, rotate with tap-rooted crop such as cotton
- **Chemical control:** Seed treatment -imidacloprid (Gaucho) 4A
-thiamethoxam (Cruiser) 4A
At planting -terbufos (Counter) 1B

White grubs

Normally white grubs are not a serious pest of sorghum, however, if present, grubs can damage sorghum by feeding on roots.

- **Cultural control:** planting sorghum in rotation with non-grass crop
- **Chemical control:** Seed treatment -clothiandin (Poncho) 4A
At planting -terbufos (Counter) 1B

Southern corn rootworm

Southern corn rootworms burrow into germinating seeds, roots, and crowns of sorghum plants. They can cause reduced stands, lower plant vigor, and the occurrence of 'dead heart' in young plants. Damage is most likely in the Coastal Bend production region.

- **Cultural control:** none
- **Chemical control:** Seed treatment -clothiandin (Poncho) 4A
At planting -terbufos (Counter) 1B
-chlorpyrifos (Lorsban) 1B
-carbofuran (Furadan) 1A

Stem and leaf insects

Cutworms

Several species of sorghum can damage sorghum. Cutworms cut sorghum plants off at, slightly above or below the surface of the soil.

- **Cultural control:** plowing or herbicides to control weeds in late summer of early fall, and thoroughly prepare seedbed at least 4-6 weeks before planting.
- **Chemical control:**
 - chlorpyrifos (Lorsban, NuFos) 1B
 - cyfluthrin (Baythroid) 3
 - cyhalothrin (Karate, Warrior) 3
 - zeta-cypermethrin (Mustang Max) 3

Yellow sugarcane aphid

Yellow sugarcane aphids feed on sorghum and inject toxin into leaves of seedlings and older plants. Damage often leads to delayed maturity and plant lodging that may be worsened by associated stalk rots.

- **Cultural control:** none
- **Chemical control:**

<u>Seed treatment</u>	-clothiandin (Poncho) 4A
	-imidacloprid (Gaucho) 4A
	-thiamethoxam (Cruiser) 4A
<u>Postemergence</u>	-dimethoate 1B
	-carbofuran (Furadan) 1A

Corn leaf aphid

Corn leaf aphids often infest the whorls and undersides of sorghum leaves in great numbers. They suck plant juices but do not inject toxin; the most apparent damage is yellow mottling of leaves that unfold from the whorl.

- **Cultural control:** none.
- **Chemical control:**

<u>Seed treatment</u>	-imidacloprid (Gaucho) 4A
	-thiamethoxam (Cruiser) 4A
<u>At planting</u>	-terbufos (Counter) 1B
	-phorate (Thimet) 1B
	-carbofuran (Furadan) 1A

Greenbug

The greenbug is an aphid that sucks plant juices and injects a toxin. Many greenbugs on booting and older plants can reduce yields and weaken plants that may later lodge. Using resistant varieties is suggested but new greenbug biotypes consistently occur.

- **Cultural control:** resistant varieties – only provide tolerance
- **Chemical control:** Seed treatment -imidacloprid (Gaucho) 4A

-thiamethoxam (Cruiser) 4A
-clothiandin (Poncho) 4A

At planting

-terbufos (Counter) 1B
-phorate (Thimet) 1B
-carbofuran (Furadan) 1A
-aldicarb (Temik) 1A
-chlorpyrifos (Lorsban) 1B

Postemergence

-dimethoate 1B
-carbofuran (Furadan) 1A
-chlorpyrifos (Lorsban, NuFos) 1B
-malathion 1B
-phorate (Thimet) 1B

Chinch bug

Chinch bugs are sporadic pests of sorghum in Texas. They suck juices from stems, leaves, or underground plant parts.

- **Cultural control:** promote dense, vigorous plant stands

- **Chemical control:** Seed treatment
-imidacloprid (Gaucho) 4A
-thiamethoxam (Cruiser) 4A
-clothiandin (Poncho) 4A

At planting

-terbufos (Counter) 1B
-aldicarb (Temik) 1A
-chlorpyrifos (Lorsban) 1B

Postemergence

-carbofuran (Furadan) 1A
-chlorpyrifos (Lorsban, NuFos) 1B
-carbaryl (Sevin) 1A
-cyfluthrin (Baythroid) 3
-cyhalothrin (Karate, Warrior) 3

Banks grass mite

Large numbers of Banks grass mite sometimes occur on sorghum, especially in more arid areas such as the Plains production regions.

- **Cultural control:** resistant varieties – only provide tolerance

- **Chemical control:**

Postemergence -dimethoate 1B
 -phorate (Thimet) 1B
 -propargite (Comite) 12C

Grain head insect pests

Sorghum midge

The sorghum midge is probably the most damaging insect pest of sorghum in Texas. The adult is a small, fragile-looking orange-red fly with a yellow head and gray, membranous wings. During the single day of adult life, each female lays about 50 eggs in flowering spikelet of sorghum.

- **Cultural control:** promote uniform heading and flowering in sorghum fields as well as control johnsongrass in and around fields.
- **Chemical control:**
 - methomyl (Lannate) 1A
 - chlorpyrifos (Lorsban, NuFos) 1B
 - malathion (Fyanon) 1B
 - cyfluthrin (Baythroid) 3
 - cyhalothrin (Karate, Warrior) 3
 - zeta-cypermethrin (Mustang Max) 3
 - esfenvalerate (Asana) 3

Corn earworm and fall armyworm (headworms)

Corn earworms and fall armyworm infest the whorls and grain heads of sorghum plants. Insecticide application may be justified if larval feeding reduces leaf area by more than 30 percent or is damaging the developing grain head within the whorl.

- **Cultural control:** none.
- **Chemical control:**
 - methomyl (Lannate) 1A
 - cyfluthrin (Baythroid) 3
 - cyhalothrin (Karate, Warrior) 3
 - zeta-cypermethrin (Mustang Max) 3
 - esfenvalerate (Asana) 3
 - carbaryl (Sevin) 1A

Sorghum webworm

Sorghum webworms occasionally infest grain heads of sorghum planted 2 to 3 weeks later than normal.

- **Cultural control:** none.

- **Chemical control:**
 - methomyl (Lannate) 1A
 - cyfluthrin (Baythroid) 3
 - cyhalothrin (Karate, Warrior) 3
 - carbaryl (Sevin) 1A

Grain head feeding bugs

Rice stink bug, southern green stink bug, conchuela stink bug, leafhopper, and false chinch bug

These species of bugs may move in relatively large numbers from alternate host plants into sorghum during kernel development.

- **Cultural control:** none.
- **Chemical control:**
 - cyfluthrin (Baythroid) 3
 - cyhalothrin (Karate, Warrior) 3
 - carbaryl (Sevin) 1A

Stalk-boring insect pests

Sugarcane borer, southwestern corn borer, European corn borer, Mexican rice borer, lesser cornstalk borer, and neotropical borer

These closely related insects tunnel into the stalks of sorghum.

- **Cultural control:** none.
- **Chemical control:**
 - cyfluthrin (Baythroid) 3
 - cyhalothrin (Karate, Warrior) 3

Diseases

Sorghum hybrids are bred for genetic resistance to most diseases. However, several sorghum diseases still cause yield loss to growers. Management of sorghum diseases is generally accomplished through resistant varieties and seed protectant fungicides. Foliar-applied fungicides are not used on sorghum in Texas. The most common seed treatment fungicides are below: (name FRAC group)

- Captan M4
- Metalaxyl (Apron) 4
- Fludioxonil 12

Common diseases of sorghum in Texas

Seed rots and seedling diseases (*Rhizoctonia solani*, *Fusarium* sp., *Pythium* sp. and others). Seed rots and seedling diseases are more prevalent when seed is planted in cool, wet soils, and especially when packing rains seal the soil surface.

- Use of high quality treated seed is the best control method.

Sorghum downy mildew (*Peronosclerospora sorghi*). Young, systemically infected plants have light green to yellowish stripes lengthwise in the leaves often with a grayish-white downy fungal growth consisting of numerous tiny spores on the lower surface of the leaf opposite the pale striped areas.

- Use seed treated with a systemic fungicide containing metalaxyl and resistant hybrids to control this disease.

Maize Dwarf Mosaic Virus (MDMV) Maize dwarf mosaic is a virus disease that occurs over all the sorghum producing areas of Texas. Its ability to cause damage is dependent on the presence of an overwintering virus host (mainly Johnsongrass), aphid populations to facilitate virus transmission and the susceptibility of the hybrid being grown.

- Use tolerant hybrids and control Johnsongrass in and around the field to manage this disease.

Head Smut (*Sporisorium reilianum*). This disease is characterized by the large, dark-brown smut galls that emerge in place of the panicle. Different races of the fungus exist which may result in a sorghum hybrid being resistant in one area but not another.

- Use resistant varieties to minimize losses.

Bacterial Stripe (*Pseudomonas andropogoni*). This is the most common bacterial disease of sorghum. The disease is characterized by long narrow stripes that vary from red to black depending on the type of sorghum.

- This disease has not been a serious enough problem to warrant specific control in Texas.

Anthracnose (*Colletotrichum graminicola*). The anthracnose fungus damages foliage and stems of grain sorghum. On susceptible hybrids, the stem holding the head

(peduncle) becomes infected and a brown sunken area with distinct margins develops. In Texas, anthracnose is restricted mostly to the gulf coast areas.

- The use of resistant hybrids and good management of crop residue are effective control measures.

Rust (*Puccinia purpurea*). Rust appears on leaves as small raised pustules or blisters that rupture and release many reddish-brown spores. Grain yield losses are usually not serious and occurrence of the disease is sporadic. Forage sorghum yields may be affected most.

Charcoal Rot (*Macrophomina phaseolina*). Grain sorghum plants affected by the charcoal rot fungus fail to fill grain properly and may lodge in the latter part of the season. Infected stalks show an internal shredding at and above the ground line. Host plants are usually in the early-milk to late-dough stage when infection occurs. The fungus is common and widely distributed in nature.

- Avoiding moisture stress, proper management of crop residue, crop rotation, avoiding excessive plant populations, balancing nitrogen and potassium fertility levels, and growing drought-tolerant, lodging-resistant hybrids represent the best means of control.

Fusarium Stalk Rot (*Fusarium moniliforme*). Like charcoal rot, *Fusarium* stalk rot usually develops on mature to nearly mature plants that have been subjected to some form of stress.

- Avoiding stress problems by proper use of cultural practices is the best approach to control.

Ergot Sorghum ergot is a disease caused by a fungus (*Claviceps africana*) that infects the ovaries of sorghum flowers and often converts them into a white, fungal mass (sphacelia). The most obvious external symptom of infection is the abundant exudation from infected flowers of an amber-colored, sticky fluid, or “honeydew,” which often drips onto the leaves and soil.

- Time planting to avoid low evening temperatures (below 55 degrees F) during the period 3 to 4 weeks prior to flowering and from flowering to 5 days thereafter.
- When planting in ergot-free areas, use seed treatment fungicides.
- After harvest, disk the fields to prevent sorghum ratoon and sorghum volunteer development.
- Manage johnsongrass within and around the borders of the field.

Weeds

Controlling weeds in sorghum in Texas is one of the most critical aspects of successful production. Unchecked weed populations can rob valuable moisture and nutrients from the crop as well as cause significant quality reductions at harvest. Recent technological advancements have changed many aspects of weed control in cotton, corn and soybeans but these advantages are absent for grain sorghum. Crop rotation is an extremely important tool for weed management in sorghum. Crop rotation with broadleaved and/or glyphosate-tolerant crops is critical to manage perennial grassy weeds such as johnsongrass and others. There are no biological control methods for weed control in sorghum.

The lack of herbicide-tolerant sorghum varieties requires producers to be vigilant in their weed control programs or risk losing production. Herbicides are by far the most widely used pesticide in sorghum production in Texas. According to NASS data, in 2003 78% of sorghum acres in Texas received at least one herbicide application. This translated into 2.88 million pounds of herbicides applied to sorghum in 2003. The most commonly used herbicides were atrazine, glyphosate, s-metolachlor, 2,4-D, and prosulfuron.

Common Weeds in Texas Sorghum Fields

Common annual grasses:

- **Texas panicum** (*Panicum texanum*) or Colorado grass is a native weed found in every region of the state. Seeds are the only source of reproduction. It flourishes in warm conditions and competes very well with sorghum.
- **Crabgrass** (*Digitaria* spp.) species are mostly native warm season weeds. Crabgrass produces large numbers of seed and can have both erect and decumbent growth habits.
- **Browntop panicum** (*Panicum fasciculatum*) is also a native warm season grassy weed. It is found in nearly every region of the state and can cause yield loss to sorghum.
- **Sprangletops** (*Leptochloa* spp.) such as red sprangletop, green sprangletop, bearded sprangletop, and Mexican sprangletop are native grassy weeds. Commonly found across the state, these weeds compete with sorghum for water and light.
- **Broadleaf signalgrass** (*Brachiaria platyphylla*) is a large-seeded annual weed that is native to Texas. Fine hairs on the wide leaves increase the competitive ability of this weed with sorghum.

Common perennial grasses:

- **Johnsongrass** (*Sorghum halapense*) is an introduced grassy weed that is probably the worst weed plaguing sorghum production in Texas. Reproducing either by seed or underground rhizomes, johnsongrass is a fierce competitor in sorghum fields. Belonging to the same genus as sorghum, johnsongrass control is difficult but left unchecked can severely decrease yield.
- **Bermudagrass** (*Cynodon dactylon*) is also an introduced perennial grassy weed that can be found in every area of the state. Commonly found in roadsides, ditches, lawns, and pastures bermudagrass is drought-tolerant and difficult to control.

Common annual broadleaf weeds:

- **Pigweed** (*Amaranthus* spp.) including Palmer amaranth, prostrate pigweed, spiny amaranth, tumble pigweed, smooth pigweed, redroot pigweed and common waterhemp are troublesome small-seeded broadleaf weeds. Pigweeds are prolific seed producers and can cause serious yield reduction if left uncontrolled.
- **Common sunflower** (*Helianthus annuus*) is an extremely troublesome broadleaf weed across Texas. Sunflowers are native to North America and have been cultivated for centuries for their edible seeds. They are commonly found in fields, roadsides, ditches, and waste areas.
- **Cocklebur** (*Xanthium strumarium*) is another native annual belonging to the sunflower family. Cocklebur fruit are one inch long, woody, with hooked prickles covering the outside of the fruit. The burs are irritating to humans and animals and seeds and seedlings contain a glycoside that is toxic to all classes of livestock.
- **Devil's claw** (*Proboscidea louisianica*) is a foul-smelling native annual sometimes referred to as unicorn plant. Plants are covered with glandular hair causing them to be very sticky. The fruit splits at maturity forming two claws, therefore the common name.
- **Smellmelon** (*Cucumis melo* var. *Dudaim*) is a vining weed that reduces crop yields by competing for sunlight and moisture. Smellmelon also interferes with crop harvest by clogging and fouling combines with vines. Each plant may produce as many as 40 melons, each containing approximately 400 seed. Mature melons will float, as will the dried sacks of seed following rotting of the melons. This weed has become a serious pest in cotton, sorghum and corn and appears to be increasing.
- **Kochia** (*Kochia scoparia*) is an annual weed growing from 2-5 feet tall and begins growth in late spring. Kochia is an annual plant originating in Eurasia, and introduced into America in the early 1900's. Primarily a weed pest in West Texas, its appearance was first recorded in Texas during the late 1940's.

Common perennial broadleaf weeds:

- **Silverleaf nightshade** (*Solanum elaeagnifolium*) is a creeping perennial spreading by roots or seeds. Silverleaf nightshade is native to the central United States and can be found in pastures, rangeland, waste areas, and cropland. The berries and foliage are poisonous to livestock.
- Perennial **morningglory** (*Ipomoea* spp.) species such as sharppod morningglory are weedy vines that can cause significant yield reductions and harvest difficulties for sorghum growers. Sharppod morningglory develops extensive underground perennial roots that can regenerate repeatedly after removal or disturbance of top growth.
- **Field bindweed** (*Convolvulus arvensis*) is a perennial from an extensive root system often climbing or forming dense mats. Field bindweed was introduced from Europe and has become a widespread and serious weed pest in many parts of the United States. It is difficult to control because of a root system that can penetrate the soil to a depth of 20 feet and which gives rise to numerous long lateral roots.

Common perennial monocot weeds:

- **Yellow nutsedge** (*Cyperus esculentus*) is an aggressive perennial superficially resembling a grass. Yellow nutsedge can spread by seed, creeping rootstocks, or by small underground tubers or nutlets. The many hard brown tubers may lie dormant in the soil for many years before producing new plants.
- **Purple nutsedge** (*Cyperus rotundus*) is another spreading perennial similar to yellow nutsedge. The underground tubers are oblong and covered by persistent reddish scales and are often formed in chains that remain connected underground. Purple nutsedge is commonly found in turf, ornamental areas, cultivated fields, and ditches.

Preemergence (PRE) Herbicides

Atrazine

- **Trade name:** Aatrex, many others.
- **WSSA MOA:** 5
- **Application timing and target weed:** preplant, preemerge, early preemergence. Very good broadleaf herbicide. Controls many broadleaf and some small-seeded annual grasses.
- **Component of other products:** Bicep II Magnum, Cinch ATZ, Bicep Lite II Magnum, Cinch ATZ Lite, Bullet 4EC, Lariat 4EC, Guardsman Max, Marksman.

In 2003, atrazine was applied to 59% of sorghum acres in Texas. At an average rate of 0.87 lb this translated into 1.83 million pounds of atrazine applied.

s-Metolachlor

- **Trade name:** Dual Magnum, many others.
- **WSSA MOA:** 15
- **Application timing and target weed:** preplant, preemerge. Very good grass herbicide. Controls many annual grasses and some small-seeded broadleaf weeds.
- **Component of other products:** Bicep II Magnum, Cinch ATZ, Bicep Lite II Magnum, Cinch ATZ Lite.

In 2003, s-metolachlor was applied to 8% of sorghum acres in Texas. At an average rate of 0.77 lb this translated into 208,000 pounds of s-metolachlor applied.

Alachlor

- **Trade name:** Micro-Tech, Intro.
- **WSSA MOA:** 15
- **Application timing and target weed:** preplant, preemerge. Very good grass herbicide. Controls many annual grasses and some small-seeded broadleaf weeds.
- **Component of other products:** Bullet 4EC, Lariat 4EC.

In 2003, alachlor was applied to 6% of sorghum acres in Texas. At an average rate of 1.25 lb this translated into 229,000 pounds of alachlor applied.

Dimethenamid

- **Trade name:** Outlook.
- **WSSA MOA:** 15
- **Application timing and target weed:** preplant, preemerge. Very good grass herbicide. Controls many annual grasses and some small-seeded broadleaf weeds.
- **Component of other products:** Guardsman Max, Guardsman Max Lite.

In 2003, dimethenamid was applied to 3% of sorghum acres in Texas. At an average rate of 1.0 lb this translated into 60,000 pounds of dimethenamid applied.

Propazine

- **Trade name:** Milo-Pro.
- **WSSA MOA:** 5

- **Application timing and target weed:** preplant, preemerge. Good broadleaf herbicide. Controls many broadleaf and some small-seeded grass weeds.
- **Component of other products:** none.

Postemergence (POST) herbicides

Pendimethalin

- **Trade name:** Prowl, Prowl H20.
- **WSSA MOA:** 3
- **Application timing and target weed:** POST to 4 inch sorghum, must culti-spray. Control many small-seeded grassy weeds.
- **Component of other products:** none.

Metsulfuron-methyl

- **Trade name:** Ally + 2,4-D.
- **WSSA MOA:** 2, 4
- **Application timing and target weed:** POST to weeds less than 6 inches. Controls many broadleaf weeds.
- **Component of other products:** none.

In 2003, metsulfuron-methyl was applied to 7% of sorghum acres in Texas. At an average rate of .002 lb this translated into 1,000 pounds of metsulfuron-methyl applied.

Carfentrazone

- **Trade name:** Aim.
- **WSSA MOA:** 14
- **Application timing and target weed:** POST to small broadleaf weeds. Control some broadleaf weeds.
- **Component of other products:** none.

Fluroxypyr

- **Trade name:** Starane.
- **WSSA MOA:** 4
- **Application timing and target weed:** POST to small broadleaf weeds. Control some broadleaf weeds.
- **Component of other products:** none.

Bromoxynil

- **Trade name:** Buctril.
- **WSSA MOA:** 6
- **Application timing and target weed:** POST to small broadleaf weeds. Control some broadleaf and grassy weeds.
- **Component of other products:** none.

Prosulfuron

- **Trade name:** Peak.
- **WSSA MOA:** 2
- **Application timing and target weed:** POST. Controls many broadleaf weeds. Commonly tank-mixed with atrazine.
- **Component of other products:** none.

In 2003, prosulfuron was applied to 10% of sorghum acres in Texas. At an average rate of .02 lb this translated into 6,000 pounds of prosulfuron applied.

Dicamba

- **Trade name:** Banvel, Clarity.
- **WSSA MOA:** 4
- **Application timing and target weed:** POST. Controls many broadleaf weeds.
- **Component of other products:** Marksman, Yukon.

In 2003, dicamba was applied to 6% of sorghum acres in Texas. At an average rate of 0.12 lb this translated into 22,000 pounds of dicamba applied.

Quinclorac

- **Trade name:** Paramount.
- **WSSA MOA:** 27, 4
- **Application timing and target weed:** POST to sorghum up to 12 inches. Controls many broadleaf weeds and suppresses some grasses.
- **Component of other products:** none.

2,4-D

- **Trade name:** various.
- **WSSA MOA:** 4

- **Application timing and target weed:** POST to sorghum 6 – 15 inches. Controls many broadleaf weeds. Do not treat during boot stage.
- **Component of other products:** none.

In 2003, 2,4-D was applied to 9% of sorghum acres in Texas. At an average rate of 0.35 lb this translated into 113,000 pounds of 2,4-D applied.

Halosulfuron

- **Trade name:** Permit.
- **WSSA MOA:** 2
- **Application timing and target weed:** POST to sorghum from 2 leaf stage through boot. Controls many broadleaf weeds and yellow and purple nutsedge.
- **Component of other products:** Yukon.

Glyphosate

- **Trade name:** various.
- **WSSA MOA:** 9
- **Application timing and target weed:** POST to sorghum after it has reached physiological maturity. Glyphosate is commonly used as a harvest aid primarily in southern portions of the state. The primary objective is to accelerate the drying process (decrease seed moisture content). However, late-season glyphosate application also improves harvest efficiency as well as controlling late-season grass and broadleaf weeds.
- **Component of other products:** none.

In 2003, glyphosate was applied to 12% of sorghum acres in Texas. At an average rate of 0.57 lb this translated into 302,000 pounds of glyphosate applied.

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Contacts

Mark A. Matocha
Extension Program Specialist
Texas AgriLife Extension Service
(979) 845-3789
ma-matocha@tamu.edu

Juerg Blumenthal
State Sorghum Specialist
Texas AgriLife Extension Service
(979) 845-2935
jblumenthal@tamu.edu

Paul A. Baumann
State Weed Specialist
Texas AgriLife Extension Service
(979) 845-4880
pbaumann@tamu.edu

Thomas Isakeit
State Plant Pathologist
Texas AgriLife Extension Service
(979) 862-1340
t-isakeit@tamu.edu