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Ratooning Grain Sorghum on the Texas Gulf Coast

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As a member of the grass family, sorghum has a panicle-type inflorescence and tillering characteristics that make it able to completely regenerate the above-ground portion of the plant. Individual sorghum plants have been kept alive for as long as 6 to 7 years where the climate is mild enough to avoid winterkill and when disease and insect protection have been provided. These important features of sorghum have allowed producers to seek a second grain crop within the same growing year, by preparing the old plants immediately following removal of the main grain crop. This decision, however, cannot be made 6 months before ratooning—it must be made considering important factors at or soon after harvest of the main crop.

When to Ratoon

Ratooning practices in the Lower Rio Grande Valley begin with shredding sorghum stalks down to a 1-inch height with a flail shredder. Shredding provides uniformity of plants. The decision to ratoon is made only after the producer observes 5 to 6 inches of regrowth, after which he or she applies about 40 to 60 units of nitrogen with 1 inch of irrigation water. In the Beaumont area, producers shred stalks down to 3 to 6 inches just after harvest and follow-on with 35 to 60 units of nitrogen (depending upon soil moisture). Ratooning is not recommended unless the sorghum field is fairly clean of weeds and has a good plant density. If too many weeds are present, ratooning should probably not be attempted for the weeds will grow a lot faster than regrowth from the sorghum stubble.

Why Ratoon?

Erosion control

One reason to ratoon in the Valley is to maximize crop residues and to keep the soil covered. On highly erodible soils, a growing crop and the main crop's residues are very effective in reducing surface runoff, wind erosion, and soil erosion.

When only a short time is allowed for land preparation and planting of the subsequent crop, the producer may notice increases in cutworms and mole crickets generated from the ratooning process. To date, these have been effectively minimized with available insecticides.

Cost-Effective Alternative to Haygrazers

Ratooning sorghum also provides a cost-effective alternative to seeding forage sorghum or haygrazers as a cover crop. Fall establishment costs for haygrazers are high, considering that these just provide surface residues coverage with what may not be a marketable crop. By allowing the grain sorghum to regrow, there are no establishment costs for seed and seedbed preparation. If enough grain sorghum is produced to offset production costs, there is an opportunity to earn some additional income while multiplying the humus/residue production with an additional top crop. Grain sorghum is a logical cover crop when it is considered that vegetables return, but a small amount of humus and haygrazers require full establishment costs.

What to Expect From Ratooning

One can usually plan on the ratoon crop to yield from 1/4 to 1/3 of the main grain crop (see Tables 1 and 2). Seldom does a great ratoon crop follow a poor main crop. The success of the second crop is often a factor of how early the main crop was planted and harvested, enabling the second crop to proceed under favorable conditions. Dry weather and high temperatures will slow juvenile growth and will reduce bloom set. In 1996 (drought year), heavy rains came too late to influence main crop yields. The ratoon crop was cut for hay, providing valuable livestock forage.

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Concerns When Ratooning

Water Stress

Except during extremely wet years following planting, the decision to take a second dryland grain harvest has resulted in failure of the next main crop of sorghum. Sorghum requires 18 to 26 inches of annual moisture to produce favorable grain yields. Under dryland conditions, those regions of South Texas receiving less than 40 inches of annual rainfall have ratoon crops generally producing less than 1,300 pounds of grain. This is not cost-effective, but predisposes the subsequent main crop to failure (low planting moisture, inadequate soil moisture storage, charcoal rot). For these reasons, sorghum ratooning has seldom been successful outside of the irrigated Lower Rio Grande Valley or high rainfall areas of counties along the Upper Gulf Coast of Texas.

If the requirements for water during the ratoon growing season and subsequent soil moisture recharge can be met through irrigation or natural rainfall, ratooning provides not only protection to the soil with multiplied humus/residue production, but also an opportunity to earn some additional income while offsetting establishment costs associated with most alternative cover crops.

Table 1. Grain Yields and Performance Factors of Ratoon Grain Sorghum, Texas Agricultural Experiment Station, (Sij), Beaumont, Texas, 1990.

Hybrid Selection[1]	Main Crop		Ratoon			Total Yield (lb./ac.)
	Yield (lb./ac.)	Bu. Wt. (lb.)	Yield (lb./ac.)	Bu. Wt. (lb.)	Bird Dam. (%)	
Topaz	5130	52.5	1970	56.0	22	7100
Wings	5130	52.9	2110	54.7	20	7240
Cherokee	5010	54.0	1550	55.8	13	6560
TS 488	4700	55.4	1800	55.8	18	6500
8313	4440	55.0	2550	56.9	15	6990
N 2665	4290	52.6	1760	54.7	10	6050
Average	4783	53.7	1957	55.6	16	6740

[1]The relationship between ratoon crop and main crop usually does not vary, regardless of the hybrid planted.

Table 2. Grain Yields and Performance Factors of Ratoon Grain Sorghum, Carl Schuster Farms, Hidalgo County, Texas, 1993.

Hybrid Selection	Main Crop		Ratoon				Total Yield (lb./ac.)
	Yield[1] (lb./ac.)	Bu. Wt. (lb.)	Yield (lb./ac.)	Bu. Wt. (lb.)	Plt. Ht. (inches)	Insect (% Dam.)	
8113	7739	60	1703	61	40.0	30	9442
AP9850	7706	60	2389	60	40.0	0	10095
AG233	7433	59	2304	62	42.0	3	9737
NC+472	7390	57	1847	59	38.0	30	9237
N 2665	6950	60	1946	60	34.0	10	8896
837CS	6279	58	2135	59	39.0	3	8414
Average	7249	59	2054	60	38.8	13	9303

[1]Grain yields were influenced by some weathering damage, where sprouted grain fell out and could not be reported.

Under the most favorable conditions, ratooning in the Lower Rio Grande Valley and Beaumont has resulted in grain yields from the main crops of 7,000 to 7,500 pounds per acre, with a ratoon crop yield of 2,500 to 3,400 pounds per acre (9,000 to 10,000 pounds per acre total). In 1993, sorghum ratooning in the Lower Rio Grande Valley was estimated at 17,000 acres with an additional 2,000 acres under management on the Upper Texas Gulf Coast.

For example, Jackson County has ratooned some sorghum, but most producers made the decision to ratoon only when conditions were most favorable (high yields, good rains being received, other producers committed to ratooning, and/or good grain prices were expected). The decision to attempt a second crop was based on the strong regrowth. These producers found that without irrigation one can usually make a successful second crop, but usually lower soil moisture and poorer seedbed conditions result for the next planting season.

Frequently there is trouble getting the crop fully matured and getting it out in time to do shredding and tillage to prepare fields for the following year. There is also a possibility that rainy, cool weather could arrive before the harvest of the ratooning sorghum. Under dryland conditions, without perfect rainfall, yields are frequently less following a ratoon crop.

Grain Quality and Insect Problems

Frequently the test weight of grain from the second crop is superior to that of the main crop. Exceptions may exist when plants are damaged or prematurely killed by insects, disease, or drought conditions. Rice borers have presented serious problems to both the main crop and the ratoon crop in some growing years, reducing yields through smaller grain, lodging, and poorer grain quality.

Insect problems appear to be less along the Upper Texas Gulf Coast, since insect populations are falling rapidly at the time ratoon grain is maturing (October through November). Beaumont, Texas, insect problems have been limited to light to moderate sorghum midge during flowering, and a low number of headworm feeders during the time that grain is maturing. In the Lower Rio Grande Valley, midge treatments are generally required, and rice borers may be heavy in most growing years.

The presence of Mexican rice borer in ratoon sorghum has been observed to influence grain yields in the Lower Rio Grande Valley of Texas. In 1993, infestations ranged from nearly 0 to 40 percent among 18 hybrids being evaluated. Most entry points and tunneling were from 2 inches above the soil line to 20 inches up the main plant stem. Damaged plants were observed with prematurely killed heads with lower test weight grain. Some heads were smaller, had smaller grain, or were diseased. With no currently labeled products available to control Mexican rice borer, this insect continues to be a major concern in double-cropping sorghum, food corn, and sugarcane.

Bird Problems

Damage and feeding by birds is the most devastating potential problem to the sorghum producer considering ratooning. Along flyways and near roosting areas, sorghum fields can be completely lost in just 4 to 5 days under heavy feeding pressure. Blackbirds, smaller migratory birds, and grackles have deterred many producers in the Lower Rio Grande Valley from considering sorghum ratooning.

Damages may be minimized through increased ratoon acreage within a growing area, where the damage is spread over a larger number of acres. Small acreages grown in areas known to be dominated with birds may become food plots if no other sources of feed are available at that time of year.

Along the Upper Texas Gulf Coast, birds are generally not a problem, except when the ratoon is delayed from July to late August. At this time, not only is the crop having a harder time obtaining enough heat units to mature the grain, but the cooler days and poorer drying conditions may require artificial drying above natural field drying. Migratory birds and blackbirds begin flocking at about this time and move southward (November).

While the number of insects feeding on sorghum is lower, the pressure from birds may result in damage to or total devastation of the ripening grain. Again, the best protection is an early planting of the main crop and shredding management for the ratoon crop, combined with sufficient ratoon acreage to dilute damage by birds.

Marketing

Valley grain producers have frequently encountered especially good markets for ratoon sorghum when Mexico has a short crop and lacks sufficient grain to feed cattle and to meet its food

grain needs. Through Progresso and other cooperating Valley elevators, grain has been shipped direct to Monterrey, Mexico. Ratoon grain grown in the Beaumont area is easily moved and mixed with grain being exported through the Ports of Beaumont or Houston.

To be cost-effective to the producer, sorghum grain prices must exceed $4 per hundredweight and ratoon yields must exceed 2,500 pounds per acre in the Lower Rio Grande Valley and 2,000 pounds per acre along the Upper Texas Gulf Coast. Years with low production or low grain prices may not be suitable for ratooning sorghum. Lower production costs may be possible in the Lower Rio Grande Valley when timely rainfall defers the requirement to irrigate.

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