Soybeans are used extensively in the manufacture of cooking oils, paints, feed supplies, plastics, and some food products. The highest Texas soybean acreage was grown in 1982, with 1 million acres planted, of which 900,000 acres were harvested. In Texas, soybean acreage is usually highest when some type of cropping disaster occurs and it is too late to plant conventional crops. In 1989 and 1992, acreage surged to 500 and 400 thousand acres, almost doubling the normal soybean acreage. If the beans produced are of sufficient quality, they are usually directed to the export market.

Reasons for Soybean Production

Low grain prices have encouraged Texas growers to seek alternative crops to increase profitability. Soybeans have offered the opportunity to rotate away from corn and sorghum without the need for much additional equipment and higher management, such as is required to produce cotton.

Soybeans allow the grower the flexibility to control troublesome row crop weeds with different families of herbicides, and the costs for fertility inputs are low. Both of these characteristics make soybeans a desirable crop. In addition, soybeans do not produce aflatoxin and, to date, have commanded good prices in oil, feed, and export markets.

Soybean acreage has increased in Victoria, Calhoun, Jackson, and Matagorda counties because of the crop’s low input costs. Both of these characteristics make soybeans a desirable crop. In addition, soybeans do not produce aflatoxin and, to date, have commanded good prices in oil, feed, and export markets.

Selection: Adaptation and Maturity

Primarily Group IV and very early Group V soybeans are grown on the Texas Gulf Coast. These are planted in late March and as late as April 20. Many of the best Group IV’s are grown on the Texas Gulf Coast. In the mid-1970s and spread to other counties along the Upper Texas Gulf Coast. Acreage in 1994 (all of Texas) reached 220,000, with nearly all beans being marketed through local elevators or by truck to the Port of Houston.
Fewer than a dozen varieties are widely grown. Some of the most consistent-yielding varieties on the Texas Gulf Coast have been Northrup King RA 452, DPL 45, DK 469, Pioneer 9501, Crawford, and JMS 4982.

Because of the distribution and timing of rainfall, early-maturing soybeans are grown only in extremely wet years south of Refugio County. North and east of Houston, the conflict with the rice planting season and the higher rainfall in August precludes the use of Group IV soybeans. Group VIII’s and VII’s are used because they may be planted in May and harvested in October and November, when rainfall is generally at a minimum. When Group IV’s were used, less than 1 year in 4 produced soybeans that were not damaged (molded, discolored) because of wet weather at harvest (August-September).

Soybeans have been grown successfully as far west as Caldwell and Wilson Counties. Rainfall in May and June is essential for acceptable yields. Soybean yields from 25 to 36 bushels are common on deep dryland soils with average rainfall. Growers in areas with a wet growing season and higher rainfall may see yields as high as 55 bushels. Only a few times have yields exceeded 60 to 65 bushels per acre on the Texas Gulf Coast. Although soybeans bloom over a wider period of time than cotton, few fine weather requirements are nearly the same. Yields of soybeans will depend on the amount and distribution of water.

### Fertility Requirements

Soybeans meet their own nitrogen requirements by fixing nitrogen from the air. This occurs in nodules produced on the roots of soybean plants. Nitrogen fixation begins about 2 to 3 weeks after emergence. Until this capability is established, seedlings survive on carbohydrates stored in the seed and soil nitrogen. When cut with a knife, productive nodules are pink, while non-fixing nodules will appear greenish or gray or white on cutting. Nitrogen-fixing bacteria are “lazy” in that they will use available soil nitrogen before fixing their own from the soil atmosphere.

### Blooming and Podding

Soybeans usually have white or purple self-pollinating flowers. There is almost no aroma to the flower, and bees and insect pollinators seldom visit these plants. Pods are borne on racemes (clusters) with 1 to 5 ovules (compartments) per pod. By far, the majority of pods have 2 or 3 ovules. Dry weather will cause seed to abort, and some ovules will remain flat.

Determinant plants cease most vegetative growth after blooming is initiated, have more lateral branches, and bloom over a shorter period of time. Indeterminate plants continue to grow while flowering, have fewer lateral branches, and generally have a longer season in maturity. Many soybean varieties are composites of both kinds of features.

### Pest Management

**Weed Control**

A successful weed control program in soybeans involves a combination of good cultural, mechanical, and chemical practices. Examples of good cultural and mechanical practices include:

- Using weed-free seed.
- Rotating crops.

**Harvest**

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### Diseases

The most common soybean diseases encountered on the Texas Gulf Coast have been various types of root rot. Southern blight has been observed in some no-till fields. There is usually not enough cool, wet weather to cause seedling diseases, but some fungal diseases have been observed during wet growing seasons with higher humidity.

### Harvest

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Planting, Fertility, and Growth

Soil and Seedbed Preparation

Soybeans should be planted to establish a row population of 30 to 32 seeds per linear foot of row. Depending on seed size, this could be 50 to 60 pounds per acre (1 busket per acre). Soybeans are self-pollinating and, like cotton, have not been hybridized.

A planter that provides uniform distribution and a consistent 1 1/2-inch seedling depth is required. Seed should be planted to good moisture. Soils should be well drained, fertile, and fine enough to permit good herbicide incorporation. Seed should be inoculated with alkaline strains of bacteria just before planting. Many producers apply a double rate of inoculum if the seed is being planted to soils where soybeans have not been previously grown.

Narrow row spacings (20 to 30 inches) will produce optimum yields if sufficient water is available. Both 30- and 36-inch rows are widely used in Texas. Soybeans are seldom double-cropped because of the risk of depleting moisture needed by the subsequent crop.

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Soybeans will respond to phosphorus and require higher levels of potassium for seed production. Many South Texas soils have sufficient potassium, so potassium fertilization may not be necessary. Soil pH should be 6.0 to 7.8 for best production. Starter fertilizer has been used on low-fertility soils to encourage early growth.

Flooding and Paddling

Soybeans usually have white or purple self-pollinating flowers. There is almost no aroma to the flower, and bees and insect pollinators seldom visit these plants. Pods are borne on racemes (clusters) with 1 to 5 ovules (compartments) per pod. By far, the majority of pods have 2 or 3 ovules. Dry weather will cause seed to abort, and some ovules will remain flat.

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Pests

Weed Control

A successful weed control program in soybeans involves a combination of good cultural, mechanical, and chemical practices. Examples of good cultural and mechanical practices include:

- Using weed-free seed.
- Rotating crops.
- Preparing the land in a manner that will provide a good seedbed and promote good seedling emergence.
- Using herbicides to control weeds that are not controlled by cultural practices.
- Cultivating in a timely manner.

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green and will increase seed moisture or delay harvest of the entire field. Late-season broadleaf weeds may also interfere with harvest and increase moisture levels. Under these conditions some type of salvaging desiccant or defoliation material may be required. Sodium chlorate has been used to desiccate weeds and rank growth as a harvest aid.

Determining Time of Harvest

As soybean plants begin to mature in late July and early August, the leaves turn yellow and brown. The plants are largely self-defoliating. Showers at harvest increase the risk of pod shattering and field losses. Periods of wetting and drying may cause the pods of some varieties to split open and eject part or all of the seed onto the ground. Soybeans should be harvested as soon as the seed reaches 13 percent moisture. At this point, the pods are brittle, and rubbing them between the palms of your hands will readily shell out the soybeans. The stems naturally dry down as the leaves are shed. If rank growth occurs and stems remain green, the long, flexible stems could interfere with harvest.

Minimizing Field Losses

Soybeans that are harvested with few splits and low weed seed contamination will command the highest prices. You can achieve a clean harvest and reduce field losses by following these recommendations:

1. Keep the combine in good repair.
2. Run the reel (tip speed) 10 to 20 percent faster than the ground speed. Excessive reel speeds tend to thresh pods at the reel instead of at the cylinder. This shatter-loss is worse with drier beans (less than 12 percent moisture).
3. Set the reel axle 8 to 12 inches ahead of the sickle on a standard header. With a pickers reel and floating cutterbar, the reel axle should be about 4 inches ahead of the cutterbar.
4. Operate the bat reel just low enough to tip the stalks into the platform. The tips of the fingers on a picking reel should clear the cutterbar by about 2 inches.
5. Keep forward speeds below 3 miles per hour.
6. Cut the stalks as low as possible. Use an automatic header control, a flexible cutterbar, or both.
7. Check the combine speed. A small deviation from the correct engine speed makes cleaning and separating difficult.
8. Set the air blast to remove chaff and straw, but not to blow beans into the tailings or out of the rear of the combine.
9. Set the cylinder speed and cylinder-concave clearance according to the operator’s manual for operating conditions. For most combines, if the recommended cylinder-concave clearance of soybeans is 1/4 to 3/8 inch at the back and 3/8 to 1/2 inch at the front. The cylinder speed must be adjusted for the threshing conditions. It is important to run cylinders as slowly as possible to achieve complete threshing. When the beans are above 13 percent moisture, they are usually tough and you may have to increase the cylinder speed to 700 to 750 rpm. As the beans dry, reduce the cylinder speed to 450 to 500 rpm. For newer John Deere combines and Case rotary machines, reduce these rpm figures by 25 percent.
10. Losing just 4 to 5 beans per square foot (across the full width of cut) means a total loss of 1 bushel per acre. Keep in mind that there could be 20 beans per square foot just behind the separator, but the average count across the full span of the machine may be much less. Check for losses and make adjustments as needed. Under normal operating conditions, losses should not exceed 1 5/4 bushels per acre. Don’t forget to include any unthreshed seed in pods clinging to the stubble.

Soybean Acreage

Acreage for soybeans has increased in South Texas. The primary contaminants of soybeans are morningglory seeds, cocklebur, and other large-seeded species. The greatest limiting factor for yield is the lack of an even and sufficient supply of rainfall to enable full podset and seed development. Occasionally soybeans reach sufficient plant size and fruit set, only to run out of available soil moisture, and the yields are low because of small seed size.

Soybean Seed Quality

Because of concerns over high temperatures and seed size, little planting seed has been produced in Southern Texas. The primary contaminants of soybeans are morningglory seeds, cocklebur, and other large-seeded species.

Soybean Acreage

Over the past two decades, soybeans have commanded more than twice the price of corn per bushel. Like corn, soybeans require rain in June and July for best performance. Interest in soybean production in South Texas began in Calhoun County in the mid-1970s and spread to other counties along the Upper Texas Gulf Coast. Acreage in 1994 (all of Texas) reached 220,000, with nearly all beans being marketed through local elevators or by truck to the Port of Houston.

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