Industrial Hemp Farming & Common Questions for Texas—V. Preliminary Production Guidelines

Dr. Reagan Noland, Extension Agronomist, Texas A&M AgriLife Extension Service, Department of Soil & Crop Sciences, San Angelo, TX.

Disclaimer: Please note that the content described in this publication is based entirely on extremely limited experience and observations by agricultural institutions in different regions around the United States. These regions include the Mid-Atlantic, Midwest, and Northern Great Plains, which are all very different environments than the agricultural production regions of Texas. These guidelines should be viewed broadly, and with the understanding that specific recommendations will almost certainly be different for Texas, and according the specific regions and cropping systems within the state. Many of the agronomic decisions required for hemp production will depend on the end use goal of the crop; e.g., fiber, grain, or floral parts for CBD oil production.

Site selection: Ideal sites for industrial hemp production have medium-textured, well-drained soils with a pH of 6.0 to 7.5. Despite claims for hemp to grow well on marginal land, current experience and recommendations emphasize that production will be optimized on fertile land with intensive management.

Variety selection: Information is not yet available regarding varieties specifically well-suited for Texas production. It is important to note that seed must come from a verified source that guarantees the tetrahydrocannabinol (THC) content will be below 0.3%. End use will also help determine the best variety choice, as shorter varieties may be best used for floral or grain production, and taller varieties are preferred for fiber production. In addition to end use, rapidly growing, tall varieties are expected to be advantageous for weed suppression.

Planting date: General guidelines suggest planting when soil temperature reaches a minimum of 46 to 50°F. For reference, the recommended minimum soil temperature for planting corn is 50°F, so optimum hemp planting date will likely correspond with the normal time of planting corn in a given region. Also similar to corn, hemp can tolerate light frost, but it is best to plant after risk of severe frost has passed.

Seeding rate: Current seeding rate recommendations vary widely, but a common theme is fiber production requires greater plant density to encourage taller plants with less branching. Seed and/or floral production will require lower stand densities, possibly ~2700 plants per acre. However, competitiveness against weeds will be compromised if stands are too thin. Ultimately, seeding rates will need to be identified based on seeds per acre and account for seed size, germination rate, and seed quality.

Planting: Stand establishment can be extremely challenging, as hemp seed quality is highly variable. The seeds are delicate relative to other agronomic crops, and are susceptible to damage during transport, handling, and planting. For example, several recommendations specify reducing airflow on seeders to minimize damage to the seed. Soil compaction, crusting, and poor drainage can all reduce ultimate emergence and establishment. The seedbed should be fine, level, and firm to maximize seed-soil contact and minimize any obstructions to emergence. Seeds should be planted 0.5 to 1 inch deep, and into moisture if possible.

Fertility: Nutrient requirements of hemp are similar to a high-yielding grain (wheat or corn) crop, although much research is needed to hone in on specific nutrient needs. Fertilizer applications should always be informed by a soil test. Rates of mineralization, movement, and availability of nutrients will vary widely across Texas soils. As a general example, current guidelines recommend fertilizer applications ranging from 50 to 150 lbs N/ac, 20 to 70 lbs P₂O₅/ac, and 20 to 80 lbs K₂O/ac. Minimum required P and K levels based on soil tests range from 30 to 40 ppm for P, and 150 to 250 ppm for K.
**Growth:** Once established, hemp can grow fairly rapidly. Reports indicate the crop can reach 12 inches 3 to 4 weeks after planting, and will close canopy and grow rapidly thereafter. Adequate moisture is most critical during establishment and through the first six weeks of growth. Although hemp is advertised as a low-water-use crop, very little information is available regarding its specific water requirements. One report indicates 12 to 15 inches of water are needed throughout the growing season. In western parts of Texas, this could likely require irrigation for successful production.

**Pests:** Hemp has known susceptibility to white mold, gray mold, and common bacterial and viral pathogens. It can also be affected by common insect pests such as corn borer, armyworm, cutworm, grubs, flea beetles, grasshoppers, and aphids. No pesticides are currently labeled for hemp in the United States. Therefore, crop rotation is currently the best practice to decrease likelihood of pest issues. Other states emphasize not following canola, soybeans, edible beans, and sunflowers with hemp due to risk of disease issues. Although these are not major crops in Texas, other common crops in our systems may be more or less conducive to pest/disease problems, and the most ideal rotation options still need to be identified.

**Harvest:** Hemp grown for seed production is most often harvested with a combine while the plants are still green. Seed harvest is timed at the onset of shatter to avoid harvest loss, and maximize the percentage of mature seed. Hemp seed is also harvested while the plants are still green to minimize the issue of mature stalk fibers wrapping in the combine. Due to early harvest, seed moisture will typically be high, and will need to be dried for storage. Once again, hemp seed is more delicate than grain crops and will need to be moved at low speed, using large diameter augers or belt conveyors to minimize damage. When hemp is harvested for fiber, it is generally cut and handled similar to hay. Timing of harvest may depend on fiber quality goals, but hemp will most often be cut during the blooming stage, as most vegetative growth and fiber production is complete and the plant is beginning reproductive growth. After cutting, hemp is left in the field for a period (up to five weeks) of breakdown called retting. This facilitates separation of the fibers whenever the hemp is processed. Retting can also be achieved with the aid of acids and/or enzymes in a processing facility; however current resources indicate that “field retting” is most common. Unlike hay, the goal is to leave as much leaf matter in the field as possible, while only harvesting the stalks. To achieve this, the crop may be raked into windrows multiple times before it is baled and transported for processing.

Floral parts important for CBD oil requires different equipment compared to fiber or seed harvest. Floral parts may be hand harvested and hung to dry similar to tobacco or harvested using modified field equipment. Trimming is necessary to remove floral parts from the stems. Small plots may not require much, if any, equipment while larger farms will necessarily need specialized equipment to reduce hand labor.

**References**


Purdue University Hemp Project. 2019. Hemp Production. [https://dev.purduehemp.org/hemp-production/](https://dev.purduehemp.org/hemp-production/)


For more information, contact one of the members of the Texas A&M AgriLife Extension Service Hemp Team

Brent Bachelor  Brent.Batchelor@ag.tamu.edu
Erika Bochat  erika.bochat@ag.tamu.edu
Bryan Davis  bryan.davis@ag.tamu.edu
Megan Eikner  megan.eikner@ag.tamu.edu
David Graf  cdgraf@ag.tamu.edu
George Knaepk  g-knaepk@tamu.edu
Jason Ott  jason.ott@ag.tamu.edu
Joe Outlaw  joutlaw@tamu.edu"
Pat Porter  p-porter@tamu.edu
Larry Redmon  l-redmon@tamu.edu
Todd Swift  twswift@ag.tamu.edu
Calvin Trostle  c-trostle@tamu.edu