# Update on Industrial Hemp for Texas—July 2020

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**Texas Department of Agriculture Hemp Licensing**

The TDA hemp page, https://www.texasagriculture.gov/RegulatoryPrograms/Hemp.aspx, has further new items of interest. In a June 19, 2020 Texas A&M AgriLife Extension webinar TDA assistant commissioner Dan Hunter noted to date TDA had issued:

- 861 producer licenses
- 351 crop permits
- 84 handler/sampler licenses (but only 73 listed as of July 7 at https://www.texasagriculture.gov/Portals/0/Files/ACP/Hemp/Handler_Sampler_List.pdf
- 158 handler licenses
- 19 processor licenses (as of July 3, now 27 processors; three have 'Extraction' in their name)
- As of July 7 there are four TDA approved labs for official THC analysis (two in Texas; see https://www.texasagriculture.gov/Portals/0/Files/ACP/Hemp/HEMP_Lab_Registration.pdf )

Mr. Hunter stressed that a transport manifest is needed to move hemp off a facility or farm. If you are not the farmer then you must have a handler license to move the hemp, even if it is a sample. Both grower and handler must have arranged for a transport manifest.

Two additional points from Mr. Hunter:

1) Samples collected by a sampler for official THC analysis going to a lab must have a transport manifest.
2) If the full crop is being transported, then the laboratory analysis THC results must accompany the crop. Transport is only allowed for samples ≤0.3% THC (or within the lab's error of analysis).

Texas A&M AgriLife recommends you regularly review the hemp licensing rules and the list of 89 FAQs on the main TDA hemp webpage. Remember, never move any part of your hemp crop—seed, plant tissue, harvest—without the proper copies of your licenses and permits and your transport manifest.

**Texas A&M Hemp Variety Trials**

AgriLife offered fee-based hemp variety trials for cannabinoids, fiber, and grain at Lubbock & San Angelo (irrigated) and Commerce & College Station (no irrigation). Trials were established as soon as we could

In receiving seed, setting up irrigation, etc. Those effective planting dates range from early June (Angelo, now some replanting), Lubbock (some over seeding), and Commerce (end of June) (Table 1). Next year's trials can expect to be planted in cooler conditions, potentially April to early May to minimize excessive heat which has been a problem this year.

**Figure 1.** Young hemp seedling with two smooth cotyledonary leaves with rounded tips, then first pair and developing second pair of true leaves (Lubbock, TX).

**Table 1.** Location and entry types of 2020 Texas A&M AgriLife hemp variety trials.

| Location | Hemp Type | # of Entries | Notes |
|---|---|---|---|
| San Angelo | Cannabinoid | 9 | 1 is straight-run seed, 4 as transplants |
| | Fiber | 2 | |
| Lubbock | Cannabinoid | 8 | 1 is straight-run seed |
| | Fiber | 6 | Also planted in dryland as an add-on observation |
| Commerce | Fiber | 4 | Irrigated to help establish stand |

In San Angelo and Lubbock, we had trouble with germination and emergence of seeded entries despite frequent irrigation. The seeded cannabinoid tests germinated and established at 5 to 25% of planted seed. We overplanted to allow for heat, seeding depth, possible soil crusts, and lack of vigor. We have enough plants to continue our trials. <u>We have observed some seedlings dying after setting their first true leaves</u> (Figs. 2 & 3). Our first suspect is intense heat and sunlight. Temperatures on the soil surface are as high as 125°F. Two Lubbock area growers with late May and June plantings have noted the same issue with young hemp seedlings dying. In one case well over half of seedlings died. This bolsters the need for planting date work in 2021 to document establishment when conditions are less stressful.

A Terry Co. farmer I visited July 8 who is testing hemp fiber varieties in dryland notes several varieties planted in mid-June seemed to have germinated OK. But when these reached the soil surface and encountered the hot conditions, they died.

◊ *If you as a first-time hemp grower in Texas have experienced similar issues AgriLife/Trostle would like to learn more about your observations. Please tell us about it.*

Despite early struggles in 100+°F heat, the four cannabinoid <u>transplants</u> at San Angelo have established and look good. For research purposes and a later-than-desired planting, we used two layers of cheesecloth over the transplants which were about 10-12" tall (Fig. 4). The plots were watered frequently with surface drip lines to keep soil conditions moist around the roots.

**Figure 2.** Early seedlings after hemp germination and emergence. The seedling on the right has died. Our most likely suspected cause is intense heat on the soil surface. Texas hemp growers in several regions of Texas have reported similar observations, more likely in later plantings. (Lubbock, TX)

**Figure 3.** Replanted hemp (early June) in Matagorda Co., Texas emerged then died during hot temperatures (upper seedling). Lower seedling may survive.

**Figure 4.** Cheesecloth doubled over a hemp transplant to protect during establishment in 100+°F heat. (San Angelo, TX)

Fiber hemp variety trials were drilled at all three locations. San Angelo was replanted the first week of July, the Lubbock site was over seeded to try to improve a poor ~1% initial stand. We had to flood irrigate the initial trial, which sometimes sinks the seed. With minimal seed remaining we over seeded on June 30. We set up a 230-gallon tank in our pickup with an electric pump and have watered the trial site twice a day since (~0.08" each time; one day with 1.0" rain) (Fig. 5A). Fortunately, this appears to be working for most varieties as we now have a reasonable number of seedlings emerging (Fig. 5B). We will continue to water twice a day until the heat abates.

**Figures 5A&B.** (Left) Light twice-daily watering of overplanted fiber hemp variety trial to aid germination and emergence in hot, dry conditions. (Right) New emerging seedlings with a few older plants from the first planting visible upper left. (Lubbock, TX)

**Major Concern—Premature Reproductive Growth in Hemp Fiber Varieties**

The first report to AgriLife of premature reproductive development in Texas hemp came from Matagorda Co. for three varieties that were planted for grain. The varieties were X-59, Henola, and Yuma (the latter a multi-purpose variety). To AgriLife's knowledge all three varieties have been planted without issue in Colorado. Matagorda Co. represents a more southerly latitude (29°N) than other U.S. hemp. The farmer reported within four weeks of planting all three varieties were showing distinct floral structure development (Figs. 6A-C). This was not expected due to the later time of year in planting. Yes, almost all hemp varieties are photoperiod sensitive, which in the case of *Cannabis* means the decreasing daylight/increasing dark period normally triggers plants to only then enter the reproductive phase

This is unexpected. Industry experts familiar with this situation say there is nothing that can be done to reverse the reproductive growth; hence the productivity of the varieties is poor.

We have now observed the same conditions with at least two fiber varieties in the AgriLife variety trials at Lubbock (and one of these is also planted at San Angelo and is expressing reproductive growth there). In the Lubbock case, one variety is from Poland so is adapted to far northerly latitudes. It showed floral structure develop in as little as 17 days after planting, or about 11 days after emergence. The second

**Figures 6A-C.** Early male and female development in May planted hemp grain varieties, Matagorda Co., TX, 2020). Left—female floral development in *X-59*. Center/right—male floral development in *Henola*.

variety is a Canadian fiber variety. These will be evaluated further for ratings of reproductive development. Several other fiber varieties are expressing the same characteristics in a farmer's fiber variety trial in Terry Co., Texas.

To date I have observed one cannabinoid variety growing in the Lubbock region that appears to be expressing early reproductive growth. Our cannabinoid variety trials at San Angelo and Lubbock will receive weekly ratings for this possible development beginning the week of July 13.

◊ *AgriLife/Trostle welcomes your observations on possible early and unexpected reproductive development in your 2020 Texas hemp. Please e-mail pictures of any plantings you have a concern about with planting date, county, and when you first observed possible reproductive growth.*

If this is an issue among several varieties, it is important to document this. I will grant, being my first year of watching hemp grow, that I do not have a good first-hand reference for what should be normal. But nevertheless, our field observations are raising questions. And knowing of more southerly and hot conditions in Texas it is important we understand what is occurring in our early hemp crops.

**An Example of Unexpected, Unexplained Hemp Seedling Death in Transplants**

A South Plains first-year hemp grower purchased feminized seed, flats, potting soil, and instructions to growth his own transplants. Germination and early growth were good. But beginning shortly after two weeks many seedlings started to die. And now about five weeks later there are at most 2% of seedlings still alive (Fig. 7). Nothing was ever transplanted.

**Figure 7.** Remaining hemp seedlings germinated in potting soil. Initial establishment was over 90%. Seedlings show symptoms consistent with a plant pathogen, possibly *Pythium* or *Rhizoctonia* though no soil was used. (Gaines Co., Texas).

The farmer has discussed his situation with Texas A&M AgriLife Extension plant pathologist Dr. Tom Isakeit, College Station. Dr. Isakeit has noted that close-up photos of the seedlings stems and roots appear consistent with known diseases (somewhat like what he sees in cotton). But this was not expected to be in the potting mix. Seedlings were watered adequately and protected from intense heat, shaded in the afternoon. This is another example of first-year "what happened?" AgriLife is not yet able to examine the hemp tissue in a research setting to determine the cause of death, if it is indeed a plant pathogen. We have collected seed, potting soil, and flats and will see if we can reproduce the conditions.

Unfortunately, the farmer has nothing to start a field crop with. Again, like the flowering issues note earlier, please contact AgriLife if you are having trouble with your hemp.

**A Good Hemp Report…**

Texas growers *are* having some good success so far! It seems those that planted earlier (May) have better crops. Figure 8 is a field of CBD hemp growing from straight-run seed in Lynn Co., Texas. It was planted with a John Deere Max Emerge planter using sugarbeet plates to drop about 70,000 seeds per acre (approx. 2.5 lbs./A). What I have learned from this grower as well as another who planted the same variety in Terry Co., it appears the ratio of female to male plants may be 4:1. I didn't realize this might be possible, I assumed a near 1:1 ratio of females and males. That would mean a greater majority of the biomass would be CBD-producing female. I have also heard from a few small acre growers whose crops seem to be doing OK.

**Figure 8.** An irrigated field of CBD hemp planted in early to mid-May grown from straight-run seed that is growing well. (Lynn Co., TX)

**Plant Diseases and Insects in 2020 Texas Hemp**

Texas A&M AgriLife wants to learn what diseases and insects may be present in your hemp crop, especially if it appears you have damage. We have two plant disease labs as well as a plant disease clinic in College Station. These are in the process of seeking approval and necessary permitting from Texas Dept. of Agriculture to receive plant tissue samples for analysis. But do not send samples yet. Until they are properly permitted with a handler license, AgriLife can only receive digital pictures of suspect hemp issues.

*For plant disease identification and possible suppression & digital pics:*

- Dr. Tom Isakeit, Professor & Extension Plant Pathologist, TAMU Dept. of Plant Pathology & Microbiology, (979) 862-1340, t-isakeit@tamu.edu
- Dr. Ken Obasa, Assistant Professor & Extension Plant Pathologist, TAMU Dept. of Plant Pathology & Microbiology, Amarillo, (806) 677-5600, ken.obasa@ag.tamu.edu

*For insect identification and biological control & digital pics:*

- Dr. Holly Davis, Assistant Professor & Extension Entomologist, TAMU Dept. of Entomology, Weslaco, (956) 969-5604, holly.davis@ag.tamu.edu

Please copy any hemp plant and insect messages to Dr. Trostle.

**Tell Texas A&M AgriLife about Your 2020 Hemp Crop & Experience**

AgriLife has developed a survey about your 2020 hemp growing. The information you may voluntarily provide will help us learn more about first-year hemp across Texas. The document is "Texas A&M

AgriLife Hemp Crop Survey—2020." Once it is approved and posted it can be downloaded at http://varietytesting.tamu.edu/hemp

**Texas A&M AgriLife Hemp Breeding Service**

*Novel Hemp Hybrids: Single Line Crosses*

Hemp hybrids with diverse genetic combinations are critically needed to develop cultivars that are well adapted across U.S. ecoregions. Controlled hybridizations of hemp, however, are complicated by both varied short-day photoperiod flowering requirements as well as the genetic plasticity of sexual dimorphism across monoecious and dioecious genotypes.

Dr. Russell Jessup is an associate professor of plant breeding, College Station, http://soilcrop.tamu.edu/people/jessup-russell-w/ He is offering a fee-based service to assist hemp breeders and geneticists to accelerate hybridization in hemp. For a short summary of his program see http://varietytesting.tamu.edu/hemp

**Common Sense and Hemp**

*Limiting Access to and Knowledge of Your Crop…*

Frankly, limiting knowledge about your first-year hemp is probably a good idea. You do not want unneeded attention, people talking about what you are doing, and others tromping you field. Some people haven't got the message clearly that industrial hemp is not marijuana. You don't need them trying to find your field then poking around. "Show and tell" isn't necessary either with friends or neighbors. And if you are growing in a greenhouse, limit access to others not working for you. Integrated pest management Extension agent John Few, Williamson Co., noted in his GH presentation in Georgetown March 11 that greenhouse sanitation is essential for hemp. One way to incur infection is unnecessary visitors to your facility.

*Be Careful What You Say…*

Hemp is subject to a lot of jokes and silly statements. The TV news anchor says to his reporter standing by, "And now for an update on a possible 'high' income earner for Texas farmers…" An AgriLife county Extension agent mentioned recently that the local fire department responded to a rural structural fire. Across the road a was a hemp field. The landowner/hemp grower says, "Too bad the hemp field doesn't catch on fire, then the whole county would get high." That comment makes it way to the county sheriff department staff. The sheriff wants to know where that field is. And who said this? That sheriff's department has requested a list from Texas Dept. of Agriculture who in the county has a license to grow hemp and where located. They appear intent on paying each grower a visit. They may just want to see what is going on and likely ask to see required paperwork.

So, let's just keep things simple and not do or say anything to draw unneeded attention to your first hemp crop. Yes, it sure is interesting and you want to tell others. But please consider limiting some of your discussion probably for the better.