

Industrial Hemp 2019

The 2018 Farm Bill has opened future possibilities for the hemp industry, but many details yet must be worked.

The federal farm bill directs the states to submit a plan for regulations to the appropriate federal agencies. The lead agency is the USDA. Since hemp has manufactured products that can be for human consumption, the FDA also has a stake in the rulemaking.

Neither of the federal agencies have promulgated rules yet. These are anticipated to be ready for the 2020 season.

Each state must submit a plan once the federal agencies tell them what they want in the plan. Kentucky has submitted its plan. It is anticipated that the feds will adopt much of the Kentucky plan.

Almost all the money currently is in the CBD. Very few people are buying the rest of the plant. Most folks not doing CBD are trying to build boutique and farmers market brands with the oils from the seeds, cottage industry textiles from the fibers, or some sort of absorbent or aggregate filler use for the hurd. There are many developing niche products and cottage manufacturers.

The CBD grows are almost always indoor. Folks with previous cannabis experience are setting up warehouses for CBD production just like they had done for other cannabis products in states where it is legal. The US legal marijuana market is saturated or restricted in broadening in many places and many growers are switching to CBD. Many are anticipating adding pot operations to CBD operation in New York when New York legalizes pot which should be 2020.

Most CBD biomass buyers want a 10% minimum CBD assay with a minimum of 10000 lb. lot of biomass at that assay. That is a lot of flower. The specs on drying and curing are all over the place. The analytical testing for pesticides, molds, heavy metals and solvents are well defined.

Seed stock for a CBD grow is \$1/seed or higher. CBD grows are not pollinated. All the male plants must be removed prior to them pollinating the females. If the plants are pollinated the concentration of CBD produced in the trichomes of the plant is significantly reduced. An indoor grow uses square footage to determine space and capacity. For an outdoor sun grow, a reasonable grow is 5000 plants per acre with a spacing of 2 to 3 feet between plants. With this spacing the plants branch and produce more inflorescence. This is referred to as a "Christmas tree" style grow. A conservative production yield target might be 1 lb. of raw flower per plant. This mass is reduced to about 0.3 lb. (150 grams) after drying and curing. Keep in mind that this material should have no seeds since the plants should not have been pollinated. An acre of "Christmas tree" style effort gives you about 750 lbs. of dried and cured flower biomass. This field product is then trimmed to produce nug which is what most processors are after. Trimming the nug reduces the overall biomass available for sale by another 10%. The biomass

is packaged as a commodity in bulk using supersacks or bins. The biomass is priced per % CBD per pound. In 2019 common average pricing is about \$3.00/%CBD/lb. The biomass must pass a series of 5 slates of analytical tests. These slates are organized into potency, pesticides, solvents, biological, and heavy metals. Each slate has a specific listing of constituents which are specifically quantified. In 2019, each state has their own developing specific constituent list. It is hoped that after the federal rules are promulgated that the specific constituents, the field sampling methods, and the in lab analytical methods will all become uniform across all states allowing industrial hemp production, processing and manufacturing. Analytical consistency is a significant issue now as the industry is developing.

To get to 10000 lbs. of nug using the 2500 harvestable grow plan, you need to account for the males (50%), the germination rates (75%) outdoors, the production losses, and the trimming losses. A conservative production yield might be $((5000 * .50) * .75) * (.3/1) * (1 - .10) = 500$ lbs. of saleable nug per acre. 10000 lbs. would require 20 acres. Weed control and male plant removal requires significant field labor during the grow season on these 20 acres.

PreProcess is developing what we call the triple harvest method. This method is a large outdoor agricultural tightly spaced grow using low CBD seeds (\$20/lb. and 30 lbs./acre). The plants are allowed to pollinate. The low level of CBD in the biomass is concentrated up by using high volume techniques versus the low throughput processing methods that use the higher concentrated nug described above. This method is based on what the Europeans have been doing for many years. Our triple harvest yields CBD, grain and stalk. Each of these three field products are then manufactured into a series of different products making use of the whole plant. This method allows more small farmers to get industrial hemp into their existing crop rotation without having to place large input outlay at significant risk.

A triple harvest grow includes sowing agriculturally (seed drill at 7 inch spacing with 1 seed per inch on the wheel), cut the tops at trichome emergence, bale the straw, decorticate into fiber for nonwovens and hurd for biomass. Extract the pollinated possible 2% CBD from the tops.

We are focused on manufacturing full spectrum CBD and terpene oils, pressed seed fatty acid triglyceride oil from the grain, meal from the grain, carbon for energy storage devices from the stalk, nonwovens fiber materials from the fiber and absorbent and aggregate materials from the hurd. We are also working on pulp and fiber products. Biofuels and other product sets are also on the drawing board.

Many large developing pharma players are entering the CBD markets. China and Europe have a long history of fiber production. The market dynamics and established competition may not favor economic development of fiber in the USA. The Canadians are putting a lot of money into CBD. They have owned their shelled seed lock on the supply chain into Costco, Walmart and the other large retail stores. They are strongly defending that position as new supply comes on line from the USA.