

Industrial Hemp: A Challenging Crop

In the last few years many people have become interested in growing industrial hemp. We have observed the acreage of this crop soar since the federal and state legislative approval of the cultivation of industrial hemp in Colorado. In just a few years, the planted acreage in CO has gone from 220 in 2014 to nearly 86,000 in 2019; nationally there were over 500,000 acres planted. The particularly strong interest in Hemp is a result of a rapidly growing cannabidiol (CBD) product market. Consumer acceptance and consumption of CBD products has been creating a strong demand for the crop production.

What makes this crop unique is that hemp has been grown around the world for several hundred years. Industrial hemp was first classified by Carl Linnaeus in 1753. He named the plant *Cannabis Sativa* L. with the L representing the first initial of his last name. He was very familiar with this crop as it was widely grown at the time in Europe for its use in fiber products. There currently are three main product areas that this crop can be a source for: seed, fiber and last but not most popular lately is the cannabidiol (CBD) market. The industrial hemp seed is relatively high in protein and oil, proving a quality feed source for many products consumed in world markets. The plant fiber is a very durable product but has a difficult time competing with synthetic products. The fiber is used around the world but is not as widely adapted. The last and fastest growing market for this crop is the CBD market. CBD is marketed now as a food and or a diet additive. There are numerous claims and testimonials promoting improved health benefits. As the recent interest and demand for consumer industrial hemp and CBD products continues to grow, it is creating market acceptance across the United States.

Industrial hemp cultivation was legislated illegal in the 1930s. The prohibition of the cultivation of hemp ended all related crop production research and variety improvement. Other crop research continued to move forward with improved varieties throughout the years, leaving hemp far behind other crops. When Colorado legislation approved the cultivation of industrial hemp in 2014, it had many plant breeders scrambling because of the shortage of reliable genetics of industrial hemp. With very limited resources of reliable genetics available around the world, many hemp breeders simply relied on feral plant material to develop new plant varieties.

Development of new reliable and stable varieties doesn't just happen overnight but may take several years. Plant breeders that are currently developing new hemp varieties are utilizing the Association of Seed Certifying Agencies (AOSCA) seed certification program as a variety verification process for maintaining their new varieties that are now being marketed. It is important to recognize that AOSCA seed certification was established over 100 years ago and began because of a need to have a traceable verification process that supports genetic purity for crop variety developers. Seed certification has been the most reliable and preferred method for maintaining genetic purity for many of the agricultural crops in our nation over the last century. Seed certification has worked very effectively to maintain varietal purity for many crops over the years and will work for industrial hemp as well.

Besides the seasoned agriculturalists, we are finding many new opportunist type growers that want to produce hemp, which is creating a unique learning curve for all. Hemp can be grown successfully, but has its own set of management obstacles when compared to other commercial crops.

I have identified some of the factors that make this crop a unique challenge.

1. The legislative limit of 0.3% Tetrahydrocannabinol (THC) for this crop separates industrial hemp from its sister crop marijuana. This strict limit of THC percentage is a concern for many because if the grower's crop is tested by their respective regulatory agency and the field is determined to have

a higher amount of THC than 0.3% the current law requires the crop to be destroyed. Since hemp production does carry a risk for the growing plants to go “hot”, the resulting destruction of the crop can be financially devastating.

2. Because of the lack of basic agronomic research, there are several production challenges. We do not have a clear understanding about plant fertility requirements, disease issues, pest problems and water requirements. Weed control is a huge issue for many growers as there are no commercial herbicides available labeled for this crop at this time. Without commercial herbicides available for weed control, growers must rely on mechanical weed control or hand weeding. Hence, the labor intensiveness may limit the size of production besides being costly to the crop budget.

3. Hemp can be grown in different planting schemes depending on what the intended production is to be used for. Planting schemes will also cause the plants to grow differently. Plant populations can be as low as 2,000 plants per acre for CBD production or at a higher population around 1,200,000 plants per acre for the production for seed or fiber. Row spacing can also be a variable in production fields. This variability can be associated to differing mechanical weed control options. Additionally, growers need to keep in mind that seed quality and seedling mortality in the field has been an issue for some growers. It is highly recommended that all seed be tested by an accredited seed laboratory to ensure good seed viability.

Even though significant challenges are associated with growing this crop, many industrial hemp growers are experiencing significant financial rewards and are excited about these new opportunities. I strongly recommend that any potential growers educate themselves with respect to all of the associated production risks. Successful growers can be described as great managers with strong attention to detail. Many successful growers start with modest acreage and expand as they learn the business. This crop can be described as an old crop reinvented with challenges and opportunities. Again I strongly encourage all potential growers of industrial hemp to seek out as much information as they possibly can.

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