Marijuana Hater's Guide to Making a Billion Dollars *from* HEMP

The Next Disruptive Industry

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Chapter One

An Introduction to Cannabis

"It ain't what you don't know that gets you into trouble.
It's what you know for sure that just ain't so."

—UNKNOWN

There is a lot of confusion around cannabis, marijuana, and hemp. Much of this confusion was started by a man named Harry J. Anslinger, who ran a brilliant misinformation campaign beginning in the 1930s that lumped them all together. The confusion that Anslinger and his friends created was made worse later by marijuana growers who liberally used the word hemp to avoid the stigma of what they were really growing.

Today, I believe most people couldn't really tell you what the difference is between cannabis, hemp, and marijuana. If that's you, don't feel bad. Up until a few years ago, I was one of those people. Not only did I not know the difference between cannabis, hemp, and marijuana, I thought all three were as deadly as cocaine and as addictive as heroin!

Let's try to cut through some of this confusion. First, let me give you a few definitions so we're on the same page:

1. **Cannabinoid:** One of a class of diverse chemical compounds that acts on cannabinoid receptors in cells. Cannabinoids have also been found to be produced naturally by humans and animals. So far, most researchers have agreed that there are 113 different cannabinoids. However, more cannabinoids continue to be discovered. As recently as 2019, Italian researchers identified two new cannabinoids.[1] As research continues, I believe we'll find hundreds more.
2. **Tetrahydrocannabinol (THC):** One of the 113 cannabinoids that have been identified in cannabis so far. THC is the principal psychoactive

agent of cannabis that affects brain function and causes alterations in perception, mood, and cognition. In other words, it's what gets you high. However, despite claims that have been made over the past several decades, scientists now know that THC does *not* cause death and does *not* kill people. For example, in an article written in 2003 by Stephen Sidney, MD, associate director for research for Kaiser Permanente, he cites two large studies that show no difference in mortality rate between marijuana smokers and nonsmokers.[2]

3. **Cannabidiol (CBD):** Another cannabinoid found in cannabis. Cannabis has been used as medicine in teas, tinctures, and oils for thousands of years. Many believe that CBD is the main cannabinoid that gives the plant its medicinal properties, though other cannabinoids are being studied. Today, CBD's therapeutic properties are being tested and confirmed by scientists and doctors around the world.

Hemp and marijuana are both produced from the cannabis plant. Hemp is usually derived from the *Cannabis sativa* L. species of cannabis. The difference between hemp and marijuana is mainly in their cultivation and processing.

The cannabis plant itself is a fast-growing genus of an annual flowering herbaceous plant. It has fibrous stalks that can be used for paper, clothing, rope, and building materials. Its leaves, flowers, and roots have traditionally been used for medicinal purposes in tinctures and essential oils, and its seeds can be used for food and fuel oil.

During a trip to Slovenia to attend the World Hemp Congress, I tasted all kinds of delicious hemp-based foods, from seasoned, toasted hemp seeds to pancakes made from hemp flour. Cannabis leaves and flowers can be consumed in several forms, such as dried flower buds or in concentrated, loose, or pressed resin that has been extracted from the flowers or leaves in a variety of ways. This resin may also be extracted from cannabis stalks with new industrial equipment.

Though cannabis has many different strains, only three cannabis species are currently recognized: *Cannabis sativa* L., *Cannabis indica*, and *Cannabis ruderalis*. While the exact origin of the plant is unknown, it is speculated to have originated in Asia (China is still the world's largest producer of hemp, producing nearly half of the world's supply according to the USDA[3]).

Cannabis sativa L., which is favored for industrial uses and applications, was first classified botanically in 1753 by Swedish-born Carolus Linnaeus. French-born Jean-Baptiste Lamarck classified *Cannabis indica* in 1785; it is named for India where Lamarck had discovered it. Because this second species produces large amounts of THC, it is most commonly used as a drug, whether for recreational or medical purposes.

Cannabis ruderalis was classified in 1924 by Russian-born D.E. Janischevsky. The name is based on the Latin word *rudera*. A ruderal species refers to any plant that is the first to emerge in an area after a natural or human-caused disturbance has removed competing plants. This species has somewhat low THC levels like *Cannabis sativa* L., so it isn't typically used for recreational drugs, though its higher concentration of CBD makes it useful for medicinal purposes. It should be noted that these last two species—*Cannabis indica* and *Cannabis ruderalis*—have been bred and crossbred with each other throughout the world to produce cannabinoid-rich strains of the plant to achieve a whole variety of physiological effects.

In all three of these species, the cannabis plant is dioecious, which means that an individual plant will be either a male plant or a female plant. This fact is extremely important to know, because it is the key to what the plant produces at the end of the day. If, for example, a farmer wants to grow hemp—the plant that has a million industrial uses and essentially *no* psychoactive ingredients—he'll typically start with *Cannabis sativa* L. seeds and broadcast these seeds in a dense pattern so that the plants will grow very tightly together. A plant grown this way can reach heights up to 16-feet tall for fiber cultivation or 5-feet to 7-feet tall for a seed crop. The rigid and slender stalks have flowering tops with relatively few leaves because the density of plants has them fighting each other for the sunlight. This dense planting also naturally chokes out competitive weeds. The hemp plant ranges from dark to light greens with bright green leaves. And importantly, a hemp crop will have cannabis plants of *both* sexes, male and female.

However, if a farmer wants to grow cannabis for marijuana for recreational drug purposes, he'll probably start with *Cannabis indica* seeds (and often with feminized seeds to grow only female plants). In this case, the seeds will be spread farther apart to encourage a

bushy growth. The plants will remain much shorter and have broader leaves. In contrast to a hemp field, which could have concentrations of hundreds of thousands of plants per acre, a marijuana field will typically grow somewhere around 450 plants per acre.

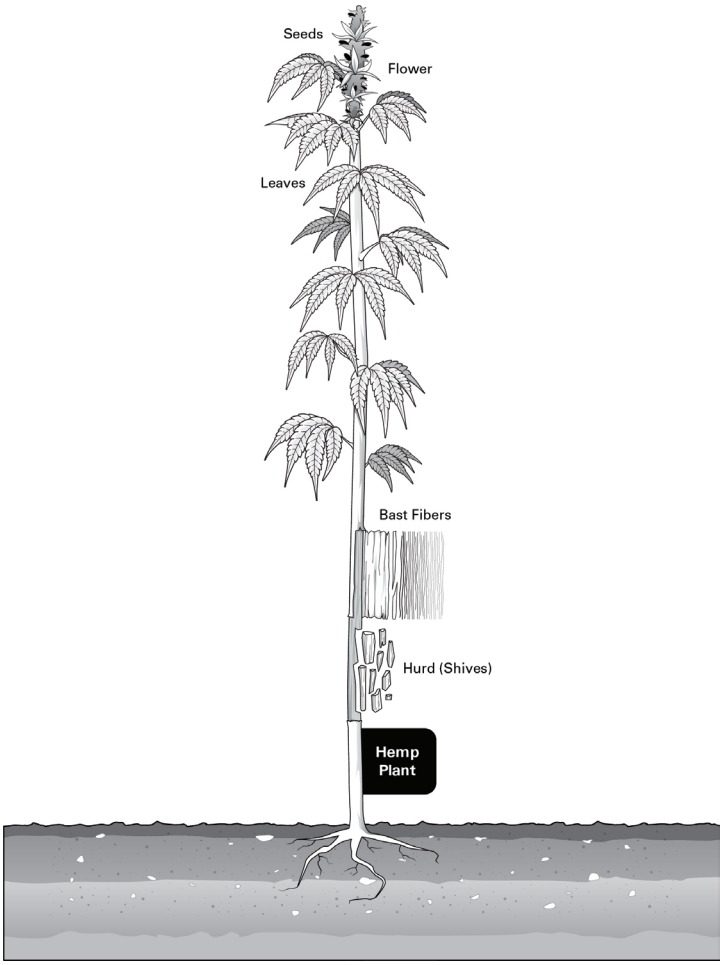
For marijuana, unless he has used feminized seeds or cuttings from a female mother plant, the farmer will check the sex of the plants (not dissimilar to checking a litter of baby kittens) at about the sixth week of growth to determine each plant's gender. He will then need to remove or cull out any male plants to keep them from cross-pollinating the female plants, because pollination inhibits a female plant from producing high concentrations of THC (which is most concentrated in the flowers of the plant). And, of course, it's the THC that makes a good crop for recreational use. The female plants left after the culling then continue to grow to maturity.

Although both hemp and marijuana can be grown from the same cannabis species (*Cannabis sativa* L.), the way they are cultivated creates dramatically different results. Industrial hemp, with both male and female plants, contains only trace amounts of the psychoactive component THC (defined as 0.3 percent or less on a dry weight basis, which is the average used for policy purposes but which is a parameter that is not based on any science) and a higher CBD content, which acts almost as an antidote to THC's intoxicating effects. Simply put, you cannot get high on industrial hemp, even if you were able to ingest an entire field of the stuff. But you can use that hemp field to produce a wide range of products, from personal care and nutritional supplements to biofuel and building materials.

So, hemp grows tall and thin, has a woody quality, and from a distance is not dissimilar from a corn field. Marijuana, on the other hand, looks more like a short bush (or a large bush when grown by those few master growers). In a hemp field, both male and female hemp plants are grown and used in the same way. However, for marijuana, as mentioned, only female plants are cultivated and harvested for their flowers, which contain the desired high THC levels. If male plants are nearby and cross-pollinate the female plants, the females will produce seeds and end up with a much lower THC concentration. This ruins their value as marijuana. On the flip side, in hemp fields,

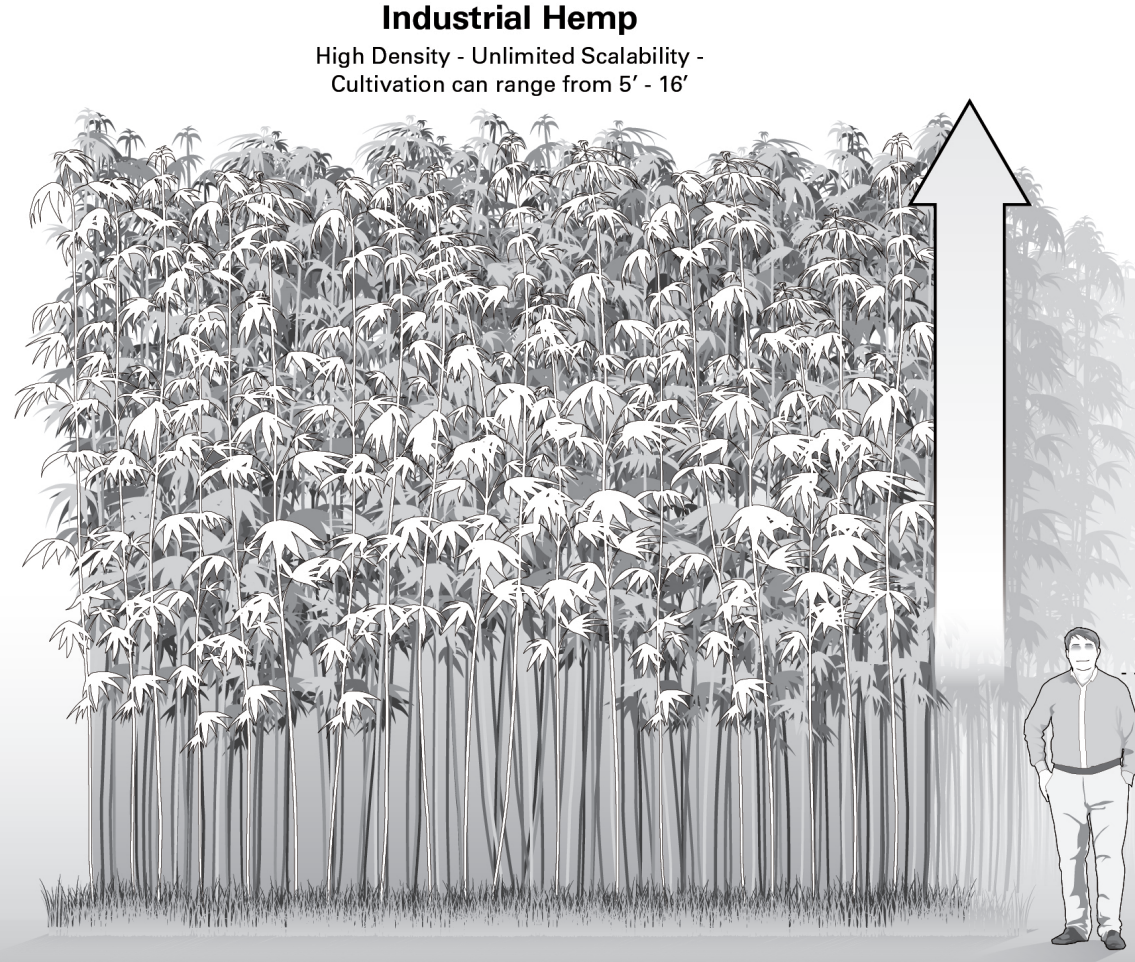
seeds are desired because they can be harvested for food, and their flowers can still be used to extract other cannabinoids.

Across the globe, cannabis thrives in temperate tropical climates and probably grows best between the 25th and 55th parallels on both sides of the equator. A cannabis crop is both durable and resilient. It grows very pervasively in places where it is intended, but it also becomes very invasive in the wild. In the northeastern United States, cannabis is referred to as "ditch weed" or more commonly around the world as just "weed."



(Fig 1.1) Cannabis plant and its parts.

For hemp, seed-to-harvest takes around four to six months, and growth can be fully achieved in as little as 100 days. Interestingly, hemp crops have less impact on the soil than crops such as corn, and they rely mainly on sun, water, and soil for their growth. In contrast, a marijuana crop typically grows within 60–90 days in indoor environments and requires a more controlled, humid environment for proper development. In fact, today many marijuana growers opt to grow their plants in carefully maintained indoor greenhouses with artificial light that can be adjusted to enhance growth and THC levels.



(Fig 1.2) Hemp Cultivation Vs. Marijuana/CBD Cultivation

As we'll see in later chapters, the confusion between cannabis grown as hemp and cannabis grown as marijuana has created a legal nightmare. Misinformation about the effects of THC has painted marijuana as a highly dangerous plant, and policing this plant was a priority in law enforcement circles. And though hemp and marijuana look quite different when cultivated, law enforcement agencies have mistaken hemp fields for marijuana,[4] and they mistakenly think that a grower could "hide" marijuana within a hemp field. As I mentioned, combining the male plants used in hemp fields with the female plants of a marijuana crop would cause the female plants to become cross-pollinated and significantly reduce their THC content, totally ruining their value as marijuana. So, even if marijuana growers had the opportunity to "hide" their crops in hemp fields, they'd be shooting themselves in the foot if they did.

So, the distinction between hemp, marijuana, and cannabis is pretty simple, right? Cannabis is the plant that can become either marijuana or industrial hemp based on how it's cultivated. And after reading the last few pages, you probably know more about cannabis, hemp, and marijuana than 95 percent of the American population! Next, let's get some historical background.