Cannabis Appellation Regions for Oregon

A solution for unwanted cross-pollination of hemp and marijuana

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Illustration 1: Medical cannabis farm in Ruch, Oregon. *Image by Keith Mansur, Oregon Cannabis Connection*

Introduction:

After decades of prohibition, the cultivation of hemp and medical marijuana are now allowed in Oregon. Hemp licenses have been issued and medical marijuana has long been legally grown in the state. Due to the passage of Measure 91 in November 2014, personal cultivation of marijuana will be allowed as of July 1, 2015, and commercial production for the coming retail market will begin. The conflict between marijuana and hemp production is inevitable due to the differing nature of the same species plant and the need to control traits in plants, yields from harvests, and quality of product. The easiest and most effective way to insure both industries can thrive is to create appellate cultivation system, or cannabis appellation regions, in the state.

Overview:

Illustration 2:Hemp field in Côtes-d'Armor, Brittany, France

As Oregon enters the cannabis re-legalization era, a solution to the potential of cross-pollination is needed. Hemp varieties need to be separated to protect the qualities of the varieties from cross-pollination and varietal loss(1). Both marijuana and industrial hemp are the same plant, Cannabis sativa, but industrial hemp was developed with a low THC level and marijuana naturally has a high level(1). They can cross pollinate easily, with Cannabis pollen traveling great distances(1,2), which leads to problems. Hemp must remain low in THC, so pollination by high THC marijuana can ruin a crop. Conversely, pollinated marijuana plants are undesirable and can destroy yields and potency in the plants. With a low THC requirement in hemp and seedless marijuana the preferred crop for the recreational and medical marijuana markets, a solution is needed.

A solution to prevent cross-pollination of Oregon's industrial hemp crops, or the hemp and marijuana crops, is to create appellation regions for cannabis. The idea of appellation regions is ancient, and references are mentioned in the bible, referring to wine of Samaria, wine of Carmel, wine of Jezreel(3).

Illustration 3: Roquefort Cheese

This age old wine and food model used in Europe for centuries allows government or region some regulatory authority over crop boundaries, production limits, crop types, and more. Most notably used for wine, it is also applied to some foods, such as cheese and olive oil(4).

With this regulatory method, Oregon can help prevent industrial hemp crops from pollination by marijuana, which would likely ruin the entire crop(1). Conversely, and the more immediate threat, is the “seeding” of marijuana by even small, experimental sized industrial hemp crops. This would degrade its quality and reduce the yield and marketability of the usually seedless marijuana crop, and could create additional costs to the marijuana growers(1).

The Problem With Hemp – Cross-Pollination:

Under Oregon's new hemp cultivation laws and rules, strict controls are placed on the levels of THC (tetrahydrocannabinol), the prominent psychoactive substance in marijuana(5). The levels must be below .03%, a remarkably low percentage which requires specific, genetically engineered, species. With this low THC requirement, cross-pollination with high THC marijuana could pose a problem for both the hemp farmer and the marijuana grower in Oregon.

Hemp that results in a high THC level is not allowed, and seed that is retained from the crop that test high will be destroyed(5). A single high THC male marijuana plant can generate about 350,000 pollen grains(1,6), and in proximity to a small hemp farm, could result in a worthless industrial hemp crop.

Illustration 4: Early development of male flowers in Cannabis sativa.

Marijuana crops grown in certain areas could also be threatened, and, most of the gardens are private medical gardens currently, so a patient's medication is at risk. Due to Oregon's climate systems and the growing requirements of marijuana, substantial amounts of outdoor marijuana is grown in limited outdoor regions, with a very large number in Southern Oregon's dry Mediterranean climate zone(7,8). Cannabis sativa is dioecious, or having both a male and female plant, and marijuana gardens today remove all male plants to prevent “seeding” of the crop. This method of cultivation produces the highest possible quality medicine and also increases crop yields dramatically(9). The resulting crop is often referred to as “sensimilla”, or “without seed”(9). Introducing an industrial hemp crop in the small valley's of this region could threaten to pollinate many of the areas outdoor marijuana gardens. Yields could be drastically reduced in gardens that are exposed to hemp pollen, as well as a reduction in THC levels and possibly other values of the plant(10,11). Additionally, growers may often be required to further process a crop to extract the remaining value from the seeded flowers, including removal of seeds and Hydrocarbon extraction(11).

Illustration 5: Hemp seed plants in the U.K.

Today's industrial hemp varieties are developed to meet low THC levels, but also specific traits. Some varieties are prodigious seed producers, and get only a few feet, while other varieties are especially tall and with few side branches, which yields the most possible fiber from a single crop(12). Keeping these varieties from cross-pollinating, especially when the farmers are relying on their own seed stocks for replanting, is important(1,12).

Cannabis pollen is very small and travels over great distances(6). Some studies have shown Cannabis sativa pollen can travel from 5 to 12 kilometers, or 3 to 7.5 miles(1,13,14). Other research has found the pollen can travel greater distances given the right conditions and topography. One study found pollen traveling from Morocco to Spain, across the Mediterranean Sea, a distance of over 30 miles(15). Expert Anndrea Hermann, President of the U.S. Hemp Industries Association and professional industrial hemp agrologist who has been a certified Health Canada THC sampler since

2005, thinks 10 miles is appropriate between marijuana and industrial hemp, or as she said, “a nice, country road drive!”(16).

Illustration 6: Hemp pollen drift across the Mediterranean Sea, over 30 miles.

A Practical Solution – Appellation Areas

By utilizing the natural topography, different climate regions, and widely dispersed growing areas in Oregon, an appellate designation for cannabis crops could be achieved. The use of crop control and appellate regions are common worldwide. These practices can allow for control of a commodity, enable market branding, prevent crop loses, insure crop quality, and more(4,17).

Wine regions across the country have created appellate regions known as viticulture areas to help define the regional wines. They insure the wines “pedigree” by geographic region of production, proper variety of grape use in the wines, soil types, and more(18). The branding enabled by these regional designations has been very beneficial to promotion of products from those regions, and the Oregon marijuana market could use a similar promotional strategy for their “sungrown cannabis”, a product often preferred to indoor grown cannabis due to its tannin and flavor profile, smoothness, and much lower impact on the environment(18.5).

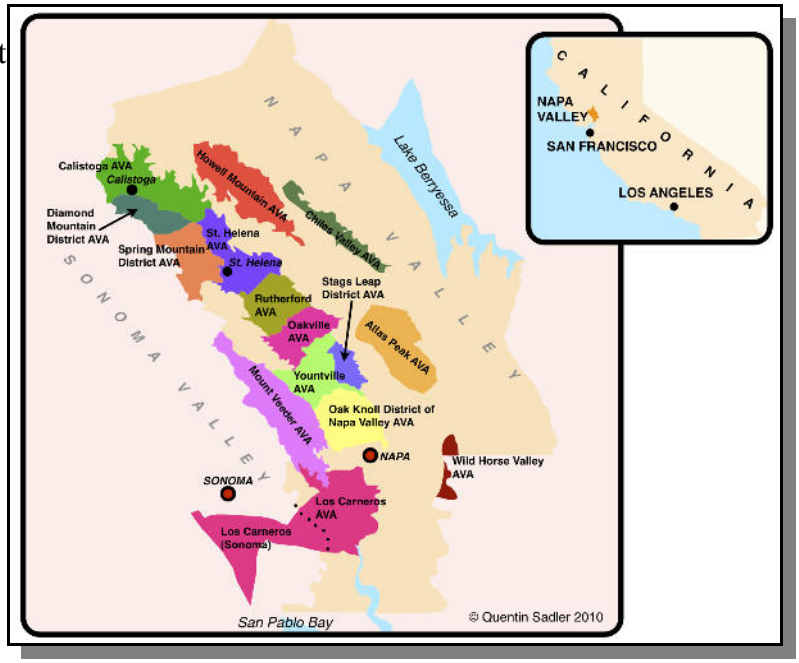


Illustration 7: [Napa Valley, California wine appellation regions]

The appellation regions would also help insure different varieties of hemp and marijuana do not cross-pollinate or create unwanted seeded flowers. Hemp and marijuana can be separated so the few outdoor marijuana regions are protected from hemp crop pollen drift, and hemp crops could be assigned regions to prevent their own unwanted varietal cross-pollination, and protection from high THC marijuana gardens.

Examples of unwanted cross-pollination problems can be found in a number of other common crops, including sugar beets, carrots, and corn. These industries have instituted rules and practices to insure their crops do not conflict, including growing only in certain regions, harvesting at different times of year, and allowing proper distance between crops. In areas of the U.S. producing sugar beet seed, flowering is a necessity. In those areas, the risk of cross-pollination increases where wild beets occur, and where other stands of beets are at a different stage of growth(19). Jefferson County, Oregon and the neighboring counties, provide the

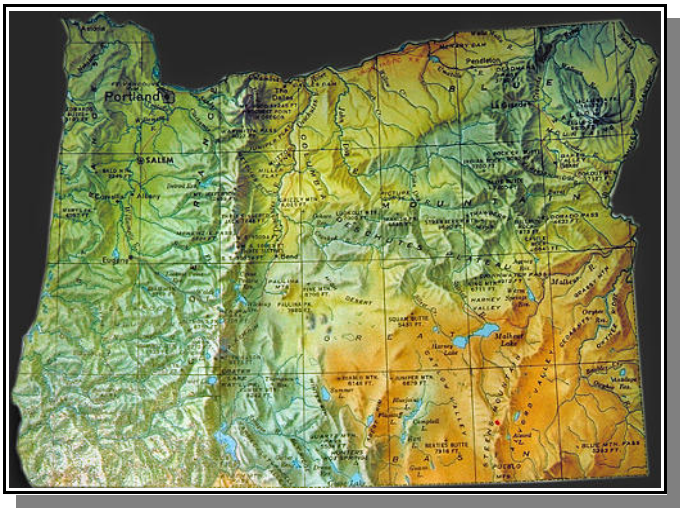
Illustration 8: Sugar Beets in the U.S. Southeast

majority of hybrid carrot seed to growers around the United States. Queens Annes Lace (wild carrot) is absent from the area, and pollination from it would ruin the seed crop. Corn growers have been careful for decades to avoid cross-pollination of field (cattle) and sweet (table) corn. Fields are planted proper distances apart and they stagger harvests to avoid contamination of their crop(21).

Illustration 9: Jefferson county, Oregon carrot seed crop

Application of Appellation Zones

Using the geography of the state, the climate zones in each region, and proper distances between each appellate region, a regional appellation system could be easily developed. The natural boundaries created by the mountains of Oregon are ideal to separate regions.*(See topographic map to right)* Temperature, climate, and other considerations, as well as available resources, such as water and proper soil types, should be considered in final determinations.



The available arable land for hemp farms in a region, especially if marijuana cultivation is good in that same region, should also be considered. Due to the very small footprint of marijuana gardens, and often the use of commercially developed soils, they can exist in dry areas with smaller valleys with less amounts of arable land. It would not make sense to plant only a few hundred acres of hemp in a region that has hundreds of marijuana gardens, purely on the possible economic impact alone. Also, the hemp farmers themselves would be risking pollination of his low THC crop by a few high THC male marijuana plants near their garden, making his following years crop worthless.

Proposed Appellation Regions:

Designate counties, or parts of counties, in the Southwest valley areas which have a Mediterranean Climate, a climate characterized by hot dry summers and cold wet winters, ideal for high THC marijuana production, as High THC zones. There arable land area is small and the surrounding mountains provide a natural barrier to pollen drift. These counties are Josephine, Jackson, and the eastern portion of Douglas *(See gold area illustration 8 and the larger zone 3 on Illustration 10).*

Areas in wetter much colder parts of the state, such as coastal regions and areas east of the Cascade

mountain range, could still produce good quality low THC industrial hemp and are not particularly good areas to grow marijuana. Due to the high amount of rain and moisture in the coastal regions, many of the gardens grown outdoor in these areas are also covered in greenhouses, which could also help mitigate cross-pollination for marijuana gardeners. These regions could be designated low THC areas where large scale hemp production would be allowed. This can be done by designating all counties that predominately lie East of the Cascade range a low THC zone *(See zones 4, 5, 6, 7, 8, and 9 on illustration 11).*

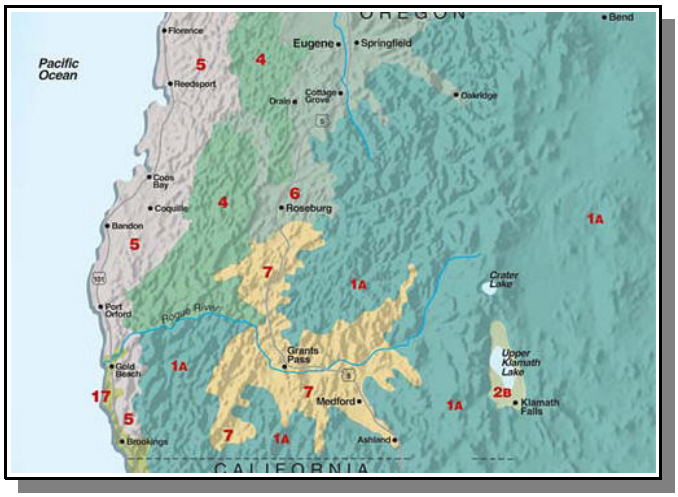


Illustration 10: Oregon's only Mediterranean zones are in Southwestern areas (in gold). *Image: Sunset Magazine*

Coastal zones that may be good for hemp cultivation could be separated by designating Clatsop, Tillamook, Lincoln, Coos, and Curry counties, with the far western portions of Lane and Douglas counties also included, as low THC zones. *(See zone 1 on illustration 11)*

The Willamette Valley is a wetter climate than marijuana typically prefers, but with a proper greenhouse or cover, cultivation is achievable. Hemp would do well there, though the soil quality is superior to that needed to effectively cultivate hemp. Since the humidity levels tend to be higher, and precipitation levels greater, the distance of pollen drift could be somewhat reduced. However, another concern may be powdery mildew, which is a common disease associated with industrial hemp. The disease could pose a problem in the Willamette Valley, a region known to battle the disease, especially in the vineyards. Further discussion would be warranted before a low THC zone in the Willamette region is established. Also, subdivisions within the valley might be possible considering it's large size. *(See zone 2 on illustration 11)*

Illustration 11: Map of generalized climate zones in Oregon (not Koppen Geiger zones)

Each appellate region would be able to further subdivide as is appropriate to their local climate, soils, and conditions. High THC areas can promote an even smaller regions product based on the unique conditions and micro-climate for those regions, an example might be “Illinois Valley” or “Upper Applegate Valley” appellations of marijuana. Low THC regions can be subdivided to “seed” growing areas and “fiber” growing areas to help stop crop losses from cross-pollination.

Conclusion:

Oregon should adopt a cannabis appellation system to help prevent problems likely to arise from cultivation of differing industrial hemp varieties low in THC and the high THC varieties of marijuana needed for the medical and adult use markets. Cannabis sativa has unique properties, and the different varieties need to be kept separate and unadulterated to maintain an already burgeoning marijuana economy and boost the potential of the industrial hemp economy in Oregon.

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