



BEACON HEMP™

ILLUMINATING HEMP GENETICS

Breeding High CBD Genetics Since 2013





OUR MISSION

Beacon Hemp is dedicated to providing the farming community with seed from innovative, stabilized and novel high cannabinoid hemp varieties through rigorous breeding and superior seed production practices.



OUR HISTORY

In 2013, under the provisions of California's Proposition 215, the founders of Beacon Hemp began breeding photoperiodic high CBD Cannabis cultivars. Informed by rigorous chemotype analysis, in 2016, we choose several lines to grow and select at acreage scale in Oregon under the state's 2014 Farm Bill pilot industrial hemp program. In addition to our photoperiodic lines, we have been working day neutral (also known as "autoflowering") hemp lineages since 2016. Our large-scale variety screenings in several different climates in combination with thorough chemotyping have allowed for the selection of superior agronomic traits, such as early flowering and resistance to fungal pathogens, as well as consistent CBD:THC ratios, high cannabinoid content, and a diversity of unique terpene profiles.

Beacon Hemp currently operates breeding and seed production facilities in several counties in California and Oregon. We offer feminized and regular seed, along with photoperiodic and day-neutral varieties of hemp.



THE BEACON DIFFERENCE

The founders of Beacon Hemp originally began breeding high CBD varieties in order to gain a competitive farming advantage. Our commitment to developing varieties with superior agronomic traits as well as stellar potency, flower morphology, and terpene profiles was born out of a desire to grow the finest hemp in the world. As extractors and fellow growers continued to express interest in Beacon's genetics our founders made the decision to release our genetics to the farming community.

Beacon primarily focuses on breeding parental lines and providing farmers with hybrid seed; hybrids tend to have improved vigor and resistance to environmental and biotic stressors. Additionally, Beacon's photo-auto hybrids

demonstrate earlier maturation windows compared their photoperiodic parents and most other high cannabinoid hemp varieties.

Beacon's rigorous development pipeline has several checkpoints, including multi-region/ climate parental selection, single seed origin selfing and full sibling inbreeding, large scale test crosses and multi-region/climate variety screenings, and unparalleled feminized seed production and seed conditioning practices.





DAY NEUTRAL VS. PHOTOPERIODIC HEMP

What is the difference between these types of hemp?

Cannabis is a unique and highly plastic plant compared to other many crops. One unique trait is that **flowering is controlled by one of two ways: day length or plant age**. Flower initiation, the stage of growth when the plant receives the signal to begin flowering, is either controlled by the number of hours of uninterrupted darkness (also known as short day or photoperiodic hemp) or by the plant's chronological age regardless of night length, also referred to as autoflower or day neutral hemp.

Photoperiodic hemp generally initiates flowers in early to mid-August as the daylength decreases. During long days/short nights plants continue to grow vegetatively, increasing in size, until they receive the signal (usually a night length of ~11 hours) to initiate flowering.

Day neutral (autoflower) hemp initiates flowering 28–35 days from sowing depending on environmental conditions, namely temperature and daily light interval. Increased temperature and daylength will increase plant size and reduce the time to flower and harvest. Except under extreme heat. Due to the limited duration of vegetative growth, day neutral hemp grows smaller and should be planted at higher densities compared to photoperiodic varieties. The smaller stature of day neutral hemp lends itself well to mechanized harvest and drying solutions.

How to choose?

Many factors might affect your decision to plant day neutral and/or photoperiodic hemp varieties. Important factors to consider when making your decision on which to plant is geographical location, climate, frost dates, available farm equipment for planting/sowing and harvesting, production goals (biomass or smokable flower), and budget.

DAY NEUTRAL VARIETIES

The Beacon Hemp line of day neutral, high CBD, industrial hemp varieties currently include three distinct cultivars; two inbred lines and two F1 hybrids. Typically, ready to harvest 75–90 days from sowing, they can help extend your growing season or add diversity to your hemp plantings.

We recommend a planting density of 10,000–15,000 plants/acre depending on the time of year, bed preparation, and harvesting capabilities. This will ensure even canopy coverage and reduce weed pressure.

Important things to consider when planting day neutral hemp:

- Seedlings must be sown in pre-formed media, since they will not have enough root growth at the early transplanting stage to hold loose-fill media together.
- **Do not allow seedlings to become root bound prior to transplant.** Avoid damaging the tap root. Doing so will reduce the long-term health and quality of the crop. Permanent stunting will occur.
- In favorable nursery conditions seedlings are ready for transplant 10 days after sowing. Plants grow fast so plan accordingly!

Please read Beacon Hemp's "***Day Neutral Variety Cultivation Guide***" for more useful information.



Auto Tsunami™

Average Days to Harvest:	75-90 days
Average Size:	2.5'h x 2.5'd
Growth Habit:	Short, bushy plants with extremely high flower to shoot/leaf ratio
CBD:THC Ratio:	24:1 to 32:1
Total Cannabinoid Potential:	~12-15%
Aroma Profile:	Very Terpinolene Dominant, Sharp haze, Lemon Pledge, Slightly Skunky
Flower Characteristics:	Large, bright green, expansive terminal flowers with white pistils



Auto Pivot™

Average Days to Harvest:	75-90 days
Average Size:	3'h x 2.5'd
Growth Habit:	Lengthy, upright plant with high flower to shoot/leaf ratio
CBD:THC Ratio:	24:1 to 32:1
Total Cannabinoid Potential:	~12-15%
Aroma Profile:	Myrcene dominant, Sweet Berry, Earthy, Kush
Flower Characteristics:	Large, dense terminal flowers and pink pistils



Auto Tune™ (F1 hybrid)

Average Days to Harvest:	75-90 days
Average Size:	3'h x 2.5'd
Growth Habit:	Upright structure of Auto Pivot, with extremely long terminal flowers of Auto Tsunami
CBD:THC Ratio:	24:1 to 32:1
Total Cannabinoid Potential:	~12-15%+
Aroma Profile:	Terpinolene dominant terpene profile with sweet and musky undertones
Flower Characteristics:	Large dense flowers that form long terminal colas



Auto Bahn™ (F1 hybrid)

Average Days to Harvest:	75-90 days
Average Size:	3'h x 2.5'd
Growth Habit:	Upright plants with long terminal flowers and high flower-to-shoot ratio
CBD:THC Ratio:	24:1 to 32:1
Total Cannabinoid Potential:	~12-15%
Aroma Profile:	Skunky, earthy, hints of hazy terpinolene and berry
Flower Characteristics:	Relatively dense flowers that are bright green in color



PHOTOPERIODIC VARIETIES

The Beacon Hemp has two lines of photoperiodic hemp offerings. Both are improvements on commonly available hemp varieties. We recommend a planting density of 3600–4800 plants per acre depending on time of year and final desired plant size.

Please read Beacon Hemp's "Photoperiodic Variety Cultivation Guide" for more useful information.

Early Line

The Beacon Hemp 'Early Line' of high CBD, photoperiodic hemp varieties currently include eight distinct cultivars that are earlier to harvest than most other high CBD hemp varieties on the market. Each 'Early Line' variety shares the same pollen donor, 'Auto Tsunami', resulting in a photo/auto hybrid that provides less time to maturity than their photoperiodic hemp counterpart and greater disease resistance inherited from 'Auto Tsunami'. Upon short day flower initiation, the Early Series hybrids are typically ready to harvest after 7–9 weeks, with the exact duration depending on variety, environmental conditions and cultural practices.

Quik Line

The Beacon Hemp 'Quik Line' of high CBD, photoperiodic hemp varieties are our newest offering. These varieties all share the same pollen donor, 'Auto Pivot', to create a unique version of industrial hemp varieties that are quicker to flower than traditional seed lines and clonal accessions, with denser flowers than Beacon's 'Early Line' of photoperiodic hemp varieties. Like the Early Line, the Quik Line hybrids are typically ready to harvest in 7–9 weeks after short day initiation, with the exact duration depending on variety, environmental conditions and cultural practices.



Bubba's Early Remedy



Average Harvest Date (@ N°42):	Late September to Early October
Average Response Time:	8.5 weeks
Average Size:	5'h x 4'd
Growth Habit:	Stout, bushy plants with tight nodal spacing
CBD:THC Ratio:	24:1 to 32:1
Total Cannabinoid Potential:	~14-18%
Aroma Profile:	β -Caryophyllene dominant with Fuel, Kush, Earth, Citrus Rind, Cherry, and Myrcene
Flower Characteristics:	Dense flowers ranging from bright green to bright purple

Early Blossom



Average Harvest Date (@ N°42):	Late September
Average Response Time:	8.5 weeks
Average Size:	5'h x 4'd
Growth Habit:	Stout, bushy plants with tight nodal spacing
CBD:THC Ratio:	24:1 to 32:1
Total Cannabinoid Potential:	~14-18%
Aroma Profile:	Sweet Berry
Flower Characteristics:	Dense bright green and purple flowers

Early Cherry



Average Harvest Date (@ N°42):	Late September
Average Response Time:	8 weeks
Average Size:	5'h x 4'd
Growth Habit:	Stout, bushy plants with tight nodal spacing
CBD:THC Ratio:	24:1 to 32:1
Total Cannabinoid Potential:	~15-20%
Aroma Profile:	Bing Cherry
Flower Characteristics:	Dense, round, bright green flowers

Early Nueve



Average Harvest Date (@ N°42):	Late September
Average Response Time:	8 weeks
Average Size:	6'h x 4'd
Growth Habit:	Long internodes in vegetative growth filled in by flowers during reproductive development
CBD:THC Ratio:	24:1 to 32:1
Total Cannabinoid Potential:	~14-18%
Aroma Profile:	Melon, Kush
Flower Characteristics:	Dense, greasy, large terminal flowers

Early Remedy™

Average Harvest Date (@ N°42):	Late September to Early October
Average Response Time:	8.5 weeks
Average Size:	5'h x 4'd
Growth Habit:	Stout, bushy plants with tight nodal spacing
CBD:THC Ratio:	24:1 to 32:1
Total Cannabinoid Potential:	~15-20%
Aroma Profile:	Citrus Rind, Cardamom, Sandalwood
Flower Characteristics:	Dense, bright green flowers



Early Spectrum

Average Harvest Date (@ N°42):	Early October
Average Response Time:	9 weeks
Average Size:	6'h x 4'd
Growth Habit:	Vigorous plant with large, lateral branches
CBD:THC Ratio:	24:1 to 32:1
Total Cannabinoid Potential:	~15-20%
Aroma Profile:	Sweet, Blueberry Haze
Flower Characteristics:	Massive, dense bright green terminal flowers (colas) on all branches



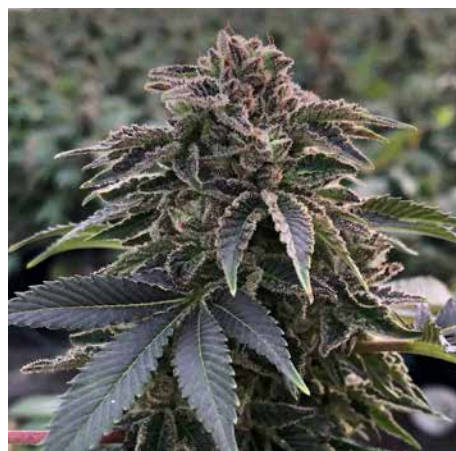
Early Suzy

Average Harvest Date (@ N°42):	Late September
Average Response Time:	8 weeks
Average Size:	5'h x 4'd
Growth Habit:	Stout, bushy plants with tight nodal spacing
CBD:THC Ratio:	24:1 to 32:1
Total Cannabinoid Potential:	~14-18%
Aroma Profile:	Haze dominant, terpinolene, creamy citrus with earthy undertones
Flower Characteristics:	Large, expansive flowers (colas) on all terminal branches



Early Wu

Average Harvest Date (@ N°42):	Late September
Average Response Time:	8 weeks
Average Size:	5'h x 4'd
Growth Habit:	Stout, bushy plants with tight nodal spacing
CBD:THC Ratio:	24:1 to 32:1
Total Cannabinoid Potential:	~14-18%
Aroma Profile:	Classic kush, fuel, skunk, earthy, undertones of terpinolene-rich haze
Flower Characteristics:	Dense, round, bright green to bright purple



Quik Spectrum



Average Harvest Date (@ N°42):	Early October
Average Response Time:	9 weeks
Average Size:	6'h x 5'd
Growth Habit:	Tall, upright plants, with greater internode spacing
CBD:THC Ratio:	24:1 to 32:1
Total Cannabinoid Potential:	~15-20%
Aroma Profile:	Sweet, Musky, Berry
Flower Characteristics:	Very long, dense colas on all terminal branches, often with pink pistils

Quik Remedy



Average Harvest Date (@ N°42):	Late September
Average Response Time:	8 weeks
Average Size:	5'h x 4'd
Growth Habit:	Stout, bushy plants with tight nodal spacing
CBD:THC Ratio:	24:1 to 32:1
Total Cannabinoid Potential:	~14-18%
Aroma Profile:	Citrus Rind, Cardamom, Sandalwood, Berry, Skunky, Earthy
Flower Characteristics:	Dense, round, bright green flowers, often with pink pistils

Quik Wu



Average Harvest Date (@ N°42):	Late September
Average Response Time:	8 weeks
Average Size:	5'h x 4'd
Growth Habit:	Stout, bushy plants with tight nodal spacing
CBD:THC Ratio:	24:1 to 32:1
Total Cannabinoid Potential:	~14-18%
Aroma Profile:	Myrcene dominant, with classic kush, fuel, skunk, earthy terpene profile with hints of berry
Flower Characteristics:	Dense, round, bright green to bright purple flowers, often with pink pistils



TIPS ON CHOOSING WHICH VARIETIES TO PLANT

While Beacon's hybrid varieties demonstrate strong heterosis (hybrid vigor) and performance under a diversity of regions and climates, some varieties are better suited to some regions/climates than others.

The Early Series has expansive flowers that will perform well under a diversity of climates and are particularly well suited for areas with high *Botrytis* pressure, such as consistent high humidity and extreme seasonal fluctuations in moisture.

The Quik Line also exemplifies hybrid vigor and produces extremely dense flowers. Although the Early Line varieties perform well in hot, arid climates, the outstanding flower density Quik Line hybrids generally produces greater yields in regions with low *Botrytis* pressure.

With the exception of the Early Spectrum and the Quik Spectrum, all of the hybrids from these series reach harvestable maturation in the middle to end of September. The Spectrum hybrids reach harvestable maturity in early October. When planting photoperiodic varieties Beacon recommends planting varieties that will allow multiple optimal harvest windows in order to clearly divide fall

harvests into multiple discrete events; this is particularly important for large farming operations as well as when producing higher value, high-touch boutique hemp or when you have limited mechanized harvest/post-harvest equipment and infrastructure.

Consider spreading out your plant maturity dates so everything isn't ready to harvest at the same time. For smokable flower production, choose varieties that have different terpene profiles. Consider final plant size. Keep harvest equipment and drying method in mind when determine the plant size.

Consider your geographic region

These varieties perform well under hot, dry heat

Bubba's Early Remedy, Early Remedy, Early Suzy, Early Cherry, Early Blossom, Quik Spectrum, Quik Wu, Quik Remedy, Auto Pivot, Auto Tune

These varieties perform well under hot, humid heat

Early Nueve, Early Spectrum, Early Remedy, Early Cherry, Early Wu, Auto Tsunami, Auto Tune

These varieties perform well under fall rains

Early Nueve, Early Spectrum, Early Remedy, Early Blossom, Early Wu, Auto Tsunami, Auto Tune

IMPORTANCE OF HIGH FLOWER TO SHOOT/LEAF RATIO

Whether growing for flower or biomass, maximizing flower to shoot/leaf ratio is key for maximizing cannabinoid production. Although planting timing and density factors heavily into flower:shoot proportion for photoperiodic lines (with later plantings at higher densities producing higher flower:shoot ratio than growing larger plants by planting earlier at lower densities), genetics also strongly influence this ratio.

Both Beacon's photoperiodic hybrids and day-neutral lines produce large terminal flowers on all branches without producing excessive foliage and stems. Additionally, despite the large terminal flowers our photoperiodic varieties are resistant to lodging (blowing over in high wind) and branch breaking, even when growing larger plants, planted earlier in the season at lower densities.



ESTIMATE YOUR SEED NEEDS BY DETERMINING YOUR PLANTING DENSITY*

1: Determine planting pattern

Determine if you are shaping beds and if so, what is bed width

- This is often dictated by what equipment you own or have local access to
- Typical options are 30", 40", 60", 80"

Decide when you will be planting

- Typically dictated by last frost date
- Harvest and post-harvest plan, equipment, and infrastructure
- What is your ultimate saleable product
- Planting photoperiodic or day-neutral plants
- If planting day-neutral are you planning to plant the same ground twice

Decide your in-row spacing

Dictated by planting timing

Square Planting:

X = in row spacing in inches; Y = between row spacing in inches

$$\text{Area per Plant (sq. in.)} = X \times Y$$

Example: 36" in row spacing with 40" beds (between row spacing)

$$\text{Area per Plant (sq. in.)} = 36 \text{ inches} \times 40 \text{ inches} = \frac{1140 \text{ sq. in.}}{\text{Plant}}$$

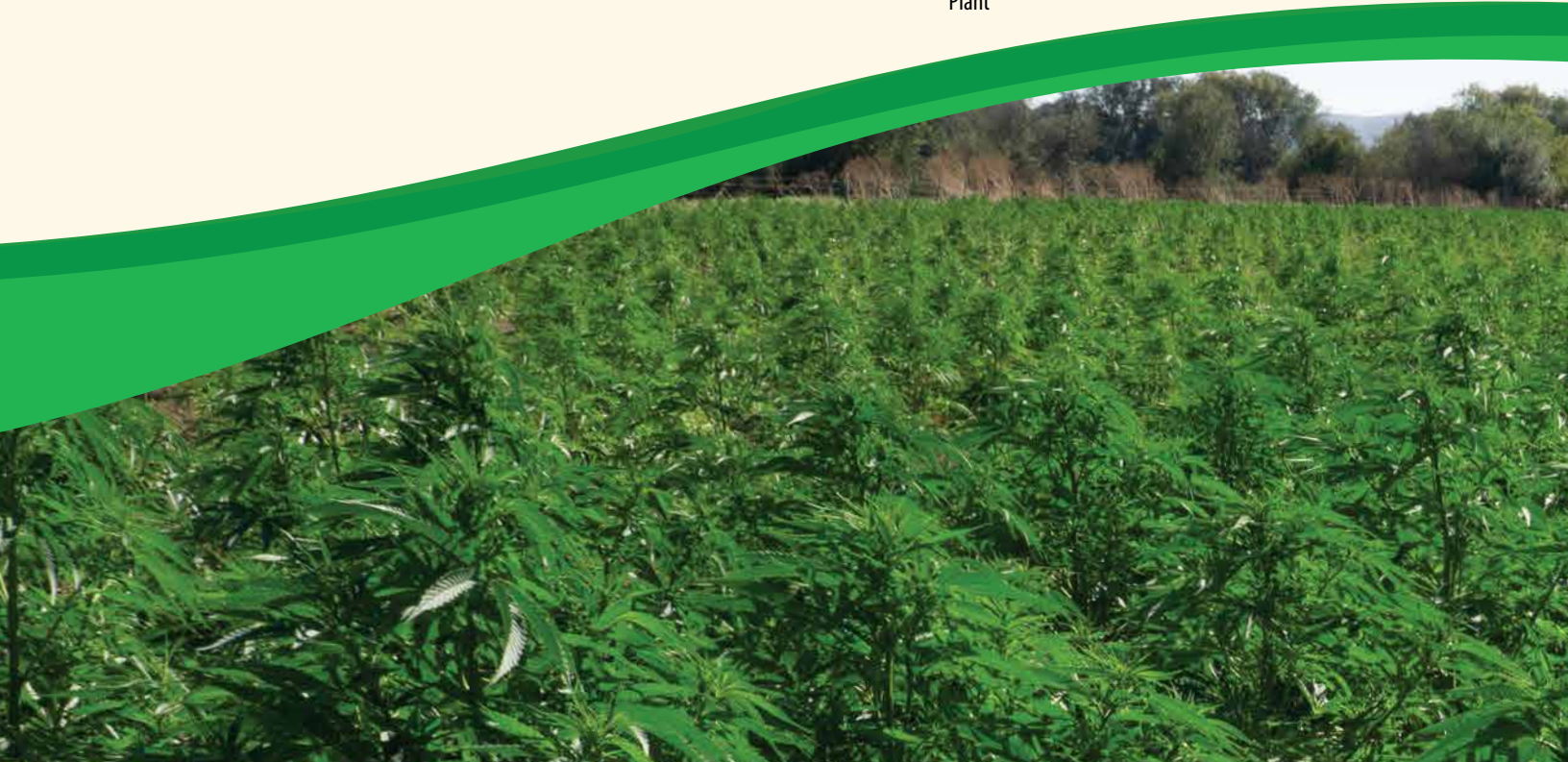
Triangle Planting:

X = in row spacing in inches; Y = between row spacing in inches

$$\text{Area per Plant (sq. in.)} = X \times [(0.866) \times Y]$$

Example: 36" in row spacing with 40" beds (between row spacing)

$$\text{Area per Plant (sq. in.)} = 36 \text{ inches} \times [(0.866) \times 40 \text{ inches}] = \frac{1247 \text{ sq. in.}}{\text{Plant}}$$



*These calculations are meant to be used as a tool to estimate number of plants needed for production. Germination rate of seed lots should be taken into consideration when determining how many transplants need to be germinated to have desired plant count. For direct sowing, stand loss should also be taken into consideration.

2: How large is your field?

Convert your total acreage to square inches

$$1 \text{ Acre} = 43,560 \text{ sq. ft.} = 6,272,640 \text{ sq. in.}$$
$$\text{Area (sq. in.)} = (\text{X Acres} \times 43560 \text{ sq. ft.}) \times \frac{144 \text{ sq. in.}}{\text{sq. ft.}}$$

3: Determine how many plants you will need for your field.

$$\text{Total Plants Needed} = \frac{\text{Area planted (sq. in.)}}{\text{Planting Area per plant (sq. in.)}}$$

Square Planting:

*Example: On 10 Acres with 36" in row, and 40" between row spacing
How many plants do you need?*

$$36 \text{ (in row distance in inches)} \times 40 \text{ (between row distance in inches)} = \frac{144 \text{ sq. in.}}{\text{sq. ft.}}$$

$$\text{Total Area (sq. ft.)} = (10 \text{ Acres} \times 4360 \text{ sq. ft.}) \times \frac{144 \text{ sq. in.}}{\text{sq. ft.}} = 62,726,400 \text{ sq. in.}$$

$$\text{Total \# of Plants} = \frac{62,726,400 \text{ sq. in.}}{1247 \text{ sq. in.}} = \mathbf{44,805} \text{ plants needed for } \mathbf{10} \text{ acres}$$

Triangle Planting:

Example: Same as above, but triangle spacing.

$$36 \text{ (in row distance in inches)} \times [(0.866) \times 40 \text{ (between row distance in inches)}] = \frac{1247 \text{ sq. in.}}{\text{sq. ft.}}$$

$$\text{Total Area (sq. ft.)} = (10 \text{ Acres} \times 4360 \text{ sq. ft.}) \times \frac{144 \text{ sq. in.}}{\text{sq. ft.}} = \mathbf{62,726,400} \text{ sq. in.}$$

$$\text{Total \# of Plants} = \frac{62,726,400 \text{ sq. in.}}{1247 \text{ sq. in.}} = \mathbf{50,302} \text{ plants needed for } \mathbf{10} \text{ acres}$$





Frequently Asked Questions (FAQs):

What sort of third-party quality assurance testing do you perform?

Beacon provides germination, purity, feminization reports, pre-harvest THC certificate of analysis (COA), and hemp permits for all seed lots.

What time of year should I plant?

We recommend early summer for photoperiodic varieties; however, this is planting density dependent. Day neutral (autoflowers) should be planted after the last frost, unless using low tunnels or other frost protection. Ideally, day neutral varieties should be planted when nightly lows are above 50°F and no lower than 45°F. Once established larger plants can withstand lower nightly temperatures during both vegetative and reproductive growth.

Should I direct seed or transplant?

Most farmers plant transplants when working with photoperiodic, feminized hemp seed. It is possible to successfully direct seed, a practice we most often see performed with day-neutral plantings. Proper ground preparation is important for both transplants and direct seeding, with direct seeding requiring even more attention to detail as it pertains to ground preparation, soil moisture content and temperature, and weather patterns during and shortly after seeding.

What density should I plant?

Planting density is based on planting timing, intended product from the crop, harvest and postharvest strategies. Generally, early summer at 9 ft²/plant for photoperiodic varieties and 2.25–4 ft²/plant for day neutral (autoflowers). Mid spring planting for photoperiodic varieties can have the planting density lowered to 24 ft²/plant, but larger plants are typically more expensive to grow, harvest, and process.

When to have pre-harvest sampling for THC analysis done?

Some states are still operating under 2014 Farm Bill pilot program regulations which vary state by state, while others will be following the 2018 Farm Bill regulations and the USDA's interim final hemp regulations. Pre-harvest THC testing should be done in accordance with local, state, and federal law. For regions requiring testing to be completed no earlier than 4 weeks prior to harvest, testing is typically conducted in late August to early September for photoperiodic varieties, and 2–3 weeks after visible bud for day neutrals (autoflowers). In states following the 15 day pre-harvest sampling interval from the USDA's interim final regulations generally sampling will occur early to mid-September testing for the photoperiodic lines and 4–5 weeks following visible bud on the day neutral lines; it is recommended that farmers track cannabinoid development on at least once per weekly basis starting at visible bud to ensure compliance while maximizing CBD production.



What does CBD to THC ratio mean?

The CBD to THC ratio is the relatively fixed proportion of CBD and THC present in the plant at any given time. While this ratio can be altered by environmental conditions and cultural practices it is essentially a fixed value.

Do you provide agronomic support?

Beacon will provide variety selection and planting recommendations. For more detailed agronomic support, we are happy to put farmers in contact with the world class agronomists that we work with.

What is required to purchase seed?

Beacon requires a copy of the purchaser's up-to-date hemp license, a signed material transfer agreement, and a deposit or full payment for seed purchase.

Can I multiply or breed with your seeds or genetics?

Beacon does not allow purchasers to propagate, multiply, or breed with Beacon's seed. We require a signed material transfer agreement (MTA) prior to the shipment of any seed. A material transfer agreement expressly details the variety and amount of seeds being purchased as well as the acceptable use for the seeds.

Do you sell sample packs?

No, our minimum order is 5000 seeds.

Do you offer volume discounts?

Yes, please contact us at info@beaconhemp.com for volume pricing.

Can seed be reserved with a deposit?

Large volume orders (at least \$100,000 purchase) can be reserved for a 25% deposit to hold seed until specified date.

Do you ship seed?

Yes, upon payment seed can be shipped via UPS or USPS.



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