

Cannabis breeding: great potential, but not for the beginner!



Selective breeding for desirable cannabis traits can result in improved cultivars, and the opportunity to improve production and profit for growers. However, these traits need to be chosen with care, says **Thomas Walker**.

Selective breeding offers the possibility of significant improvements in cannabis plants, and these can take numerous forms.

Plants can breed for greater yields by selecting for large, dense bud formations. At the same time, care should be taken to ensure that the branches offer a strong support structure that can carry the heavy buds.

Breeding can also be used to develop new flavours. Currently, the most popular cannabis cultivars fall into two main flavour categories: fruity (Blue Dream) and gassy (Larry OG).

IT NEEDS RESEARCH AND DEVELOPMENT, AND A RETURN ON INVESTMENT IS NOT GUARANTEED

Through selective breeding, plants can be identified that have increased disease and pest resistance. This is crucial for the long-term success of commercial production.

Selective breeding allows for the customisation of specific active pharmaceutical ingredients (APIs) such as tetrahydrocannabinol (THC), cannabidiol (CBD), cannabinol (CBN), cannabigerol (CBG), and so forth. If your offtaker wants a cultivar that consists of high CBG and low THC, breeding can achieve this.

Plants can also be bred for shorter vegetative phases facilitated by rapid growth. This equates to more cycles per year. There are also advantages to having shorter plants with strong 90° branches that can carry heavy buds and allow for easier processing and canopy management.

Environmental variables may make it difficult to grow certain cultivars, and this is where breeding can also help. For example, in areas with high relative humidity, you will be able to introduce cannabis cultivars with high humidity resistance.

Selective breeding offers the opportunity to increase the ratio of oil produced when extracting. Cannabis oil is derived from the trichomes, which are essentially bulbous sacks; more trichomes equal more oil.

Many cannabis cultivars root vigorously. By crossing with these strains, a breeder can help to ensure that commercial growers don't suffer from any bottlenecks in production.

CAUTION REQUIRED

Despite the advantages mentioned, it is inadvisable to breed cannabis as a start-up company, for the following reasons:

- **The risk of pollination to the production line**

When producing bud or cannabis APIs, it is essential to use only females. With the introduction of male plants, the risk of pollination becomes a real threat. Females that are pollinated produce seeds and lower the APIs of the product; this can push APIs out of range, leading to the offtaker refusing to buy the product.

- **It takes time to make profits**

Once desirable females and males have been selected, the male pollen is used to pollinate the female flower. Viable seed will form at the pollination site up to six weeks after pollination. Seeds are then harvested, sorted, and grown to full maturity. The crosses are examined and the best candidates selected for further breeding. Throughout this process, laboratory tests are conducted

to ensure that the most desirable offspring are selected. Then, once again, desirable offspring are pollinated to produce stable varieties, and the process is repeated many times over.

- **Increased cultivation space usage**

Breeding cannabis requires plenty of space. The most desirable plants are taken full-term to flowering to ensure that the end product meets the intended specifications of yield, appearance, pest and pathogen resistance, and so forth.

It can take over two years to generate revenue, and inefficient use of cultivation space is almost certain to delay your path to profitability. The focus should be on a lean start-up that facilitates rapid market penetration while keeping reserves of capital for emergencies.

INCREASED COSTS

Essentially, breeding involves research and development, and a return on investment is never guaranteed.

Breeding can be a great tool to diversify the operations of a cannabis business. It can create new varieties of cannabis that exhibit new flavours, API combinations or isolations, increased pest and disease resistance, increased oil production, provide larger yields, and increase the rooting speed of clones.

Breeding can optimise production or create a new revenue stream.

Despite all this, breeding proprietary genetics should not be undertaken by new start-ups. This can complicate the process and lead to delayed market penetration. Once the business is profitable, breeding can be introduced if need be.

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