CONTENTS

Introduction ........................................................................................................................................... 3

Part 1: What is Cloning? ............................................................................................................................ 3

   Why Clone Cannabis Plants? .................................................................................................................. 4

Part 2: What You Will Need To Clone ....................................................................................................... 5

   More Cloning Tips .................................................................................................................................. 9

Part 3: Aeroponic Cloning Methods ......................................................................................................... 10

   How Aeroponic Cloning Machines Work .............................................................................................. 10

   How To Use Aeroponic Cloning Machines ........................................................................................... 11

Part 4: Transplanting Clones ..................................................................................................................... 12
INTRODUCTION

In this course we will go over the various ways to clone cannabis. We will show you mistakes to avoid, and how to quickly become great at cloning.

PART 1: WHAT IS CLONING?

Cloning is the process of making an exact genetic match of a plant. Cloning cannabis is getting more and more popular as the cannabis industry continues to grow.

If you have a female plant that you know you liked the result from, simply take a cutting from it and start another one.

Cloning is an easy way to make new plants. Growers can take many cuttings from a healthy “Mother Plant” and grow lots of replicas.
A clone is simply a little piece of a plant that has been cut and given the chance to root on its own.

**WHY CLONE CANNABIS PLANTS?**

Here are some reasons why cloning is a good thing to do:

- Guarantee a female plant if the cutting comes from a female plant
- Make many clones from just one plant
- Cut down on expenses from buying seeds
- Clones grow faster since it skips the germination and seedling stages
PART 2- WHAT YOU WILL NEED TO CLONE

◉ A healthy, vigorous, potent, delicious, amazing Mother Plant to take cuttings from

◉ A Razor or Sharp Scissors

◉ Cloning Gel (or Powder)

◉ Starter Cubes To Put the Clones In (or Soil or a Soilless Mix)

◉ A Compact Fluorescent Light (If using HID or LED make sure to give ample distance to avoid burning)

◉ Humidity Dome With Closable Vents

◉ Waterproof Tray and Tray Insert

◉ Fine Mist Spray Bottle

◉ pH Kit

Step 1= Prepare the Mother Plant for optimal conditions. Starting 5 days before taking the cuttings, do not fertilize the mother plant at all. This will lower the nitrogen levels in the mother. Spray the mother with water the day before taking the cuttings, and the day of. The lower the amount of nitrogen in the clones, the less they will try to grow vegetation and the more focus they will put on rooting.
**Step 2** = Prepare the water. Make sure the pH of the water you will be using is between 6.0 and 6.5.  
If using rockwool, the pH can be as low as 5.5  
If using rockwool, soak the cubes in water overnight.  
If using soil, wet the soil and insert it into the waterproof tray.  

**Step 2** = Choose a spot on the mother plant that shows new growth and cut cleanly at a 45 degree angle below it.  
Cut off about 3 to 4 inches in length.  
The lower down on the mother plant the better.  

**Step 3** = Scrape the bottom of the cutting so it exposes more of the insides of the plant which will promote a faster rate of rooting.  

**Step 4** = Quickly dip the exposed bottom of the cutting in the rooting hormone. Be sure to get the entire bottom of the cutting.  

**Step 5** = Cut off any lower leaves from the cutting. You can also trim some of the top leaves if you want.  

**Step 6** = Put the clone into the wet starter cube. You can use Jiffy Pellets, Peat Pellets, Rockwool, Soil, Coco, or Hydroton.  
(We like to use Jiffy Pellets or Rockwool)  
Jiffy Pellets are terrific for cloning because they start as thin “pucks”, and expand once water is added. Plus they are easy to transplant without shocking the plants.
**Step 7** Place your new little plants under the humidity dome on top of the tray. If you don’t have a dome, you can simply put them underneath your light. (We love humidity domes since they can easily keep the environment the way clones like it)

Clones love warm, humid, and wet environments.

If you don’t have a humidity dome you can lightly mist your clones with water each day.

You can use a heating pad underneath the dome to keep it warm.

We recommend using an 18 hours of light, and 6 hours of darkness schedule for clones.

We love CFL bulbs for clones.

A bulb like a T5 or T12 with about 20 to 40 watts should be fine for these fragile little plants.

If you are using LED’s, HPS, or MH bulbs, make sure to leave a lot of space between the plants and the bulbs, up to 4 or 5 feet, because clones can burn very easily.

Be sure to not introduce any stronger lights to the clones for at least the first 10 days.

During these first few days, clones are focusing their energy on developing roots.

Do not switch the clones to stronger lights until you see a strong root system developed.

Clones should root within 7 to 10 days.

Sometimes it can take a couple weeks.

Do not worry if the leaves of the clones turn light green or even yellow. They are using up the nutrients stored within the leaves.

Some people like to put clones in plastic cups that they poke some drainage holes in the bottom of.

You can fill the cups with soil, perlite and vermiculite and wet it.
Or you can just use a straight potting soil like Black Gold, Fox Farm Ocean Forest, or Roots Organic Formula 707.

Then stick the cutting in there after putting the cutting in the rooting hormone and lightly scraping the skin at the bottom of the split stem to expose more of the cambium layer.

The cambium layer is where the plant generates its roots.

Whatever medium you choose, make sure that you press around the hole after you put the cutting in it so it is securely settled.

This will keep air away from the area where the rooting is taking place.

Some people that use humidity domes like to spray the insides of it with water so it gives a boost to the amount of humidity in it.
MORE CLONING TIPS

You can pretreat your rooting pellets or pucks with a nutrient called “House & Garden Roots Excelurator”.

(We recommend using this product throughout, all the way to about halfway through the flowering phase)

It is literally like a steroid for cannabis plants.

*Keep clones in a temperature between 68-75 degrees Fahrenheit.

If using a heating mat underneath them, be sure to monitor the temperature.

If you do not see any roots within the first 12 days, you may want to consider throwing your cuttings out and starting over.

Clones usually will at least show some roots within this time.

If the cuttings droop down and do not recover, then throw them away.

Your clones are ready to transplant when the leaves are upright, they are a healthy green, and the root ball is exposed on all sides of the bottom of the medium you used.

You should have at least an 85% success rate with clones rooting.
PART 3- AEROPONIC CLONING METHODS

Aeroponic cloning machines are extremely popular in the world of cannabis growing. The machines have some distinct advantages over standard cloning methods. Cloning machines allow the grower to avoid needing to spend money and time on the growing medium.

HOW AEROPONIC CLONING MACHINES WORK

In most aeroponic cloning machines, a submerged pump sends nutrient solution into low-pressure misters. An evenly distributed mist is sent to the cuttings through the misters. A humidity dome is not needed since the cuttings are able to uptake any moisture they need straight from the mist.

Two commonly sold aeroponic clone machines are sold by

EZ-Clone
&
Botanicare
The systems range in pricing depending on how many clones you want to be able to put in them.

The EZ-Clone comes in 30, 60, and 120 sizes.

You can expect to spend anywhere from $200 to $1500 for aeroponic clone machines. Most small units for personal grows are around $250 to $300.

**HOW TO USE AEROПONIC CLONING MACHINES**

Step 1= Fill the unit with water that is around 65 to 70 degrees Fahrenheit up to the level that is indicated.

Step 2= Dip the cutting in the rooting hormone and put the stem through the middle of one of foam discs included with the machine. Make sure at least 2 inches of stem hangs below the lid in the misting area.

Step 3= Sit back and watch the cuttings root.

If you notice that the roots are brown instead of white, you may need to lower the temperature of your water.

Many people that use aeroponic clone machines like to use reverse osmosis water.
PART 4- TRANSPLANTING CLONES

Learning how to transplant clones or seedlings is important for new growers. Transplanting from one environment to another is a crucial step of gardening. The improper transplant can shock the plants and cause problems such as nutrient lock-up and oxygen deprivation.

As already discusses, cloned cannabis plants are produced using one of two methods:

1. Plug Cloning
2. Aeroponic Cloning

“Plug” cloning is done in a root plug, like “rapid rooters”, “rockwool”, and “Jiffy Pellets”. The plugs are put in a high humidity environment and kept moist until they form a firm root structure.

Aeroponic cloning on the other hand uses an electric pump in an enclosed environment to spray nutrient solution on the bottom of the cuttings until roots form and dangle down.

Aeroponic cloning is typically faster than plug cloning at forming roots.

You know it is time to transplant when you see white roots surrounding the entire grow medium.

If you only see one or two roots here or there, the plants need more time to form a healthy root structure.

The First thing to make sure of is that you clean the area you will be working with.

Start with fresh soil and clean pots if transplanting into soil.

If you are using plastic pots from a previous grow, wash them with bleach or hydrogen peroxide before using them again.

If your clones are from outside sources, let them sit for a few days in a different room than the other plants, so you can make sure they don’t have any bugs on them before introducing them to your garden.
When filling your pots, try to fill them all to the same level.
Do not fill the soil all the way up to the top.
Leave some room for the water to settle into the soil.
If you are consistent with the level of soil in each pot it will help you with your watering.
Do not compact the soil too much in the pots. It will stunt root growth and negatively affect the drainage.
Do not forget to always water after transplanting.
The water will help prevent the possibility of shock, and it will remove air pockets and help settle the soil.
Make sure you are transplanting into the correct size pot.
Do not use pots that are too big.
The bigger pots means more light will be needed and more room will be taken up in the grow space.
Plus bigger pots need more soil and water.
In general, pots should double in size each time a plant is transplanted.
If you are transplanting clones or seedlings that were in an aeroponic clone machine with the roots bare, use a careful touch to evenly spread out the roots in the soil.

If your seedlings or clones are in a plug or cube, you can simply dig a small hole in the soil and put the whole cube in there.

You can pack the soil over the cube.

If you started your clones or seedlings in soil, you will need to transplant to a larger pot.

There are two ways to move the plant and soil to the new pot without causing too much shock.

The first way is to cut away the base of the container the plant is in, and then just add the entire plant into the bigger pot of soil.

The plants roots will grow down in the larger pot.

The second way is to first make sure the soil you are transplanting from is very dry and has not been watered for a few days.

Then you can use a knife and carefully cut around the plant inside of the pot it is in, and after cutting around it, put your fingers down in it and pull both the plant and the soil.

Then immediately put the plant and soil into the larger pot and fill around it with soil.

Make sure to never lift plants out by their stems.

At times, if soil is extremely compact in a container, it can be turned upside down and the entire plant and soil will come out in one big piece.

A lot of growers do this method, simply turning the entire container upside down and wiggling out the entire mass.

We recommend not to feed a newly transplanted plant for the first week after transplant anything but water.

Before transplanting into a container, make sure to dig a hole in the new container for the plant to slide down into.

Then cover the area around the plant with new soil and add water.

Some growers like to use additives that help prevent shock to cannabis plants when transplanting.
Commonly used products are seaweed extract, and beneficial bacteria, or “Superthrive”.

Make sure to give newly transplanted plants not too much light for the first few days.

We like to transplant at night, and give the plants a full night of darkness their first evening.

Many growers prefer to keep plants in the same type of medium throughout. Meaning, if they start in rockwool, they stay in rockwool.

They just move them into bigger rockwool.

Whichever medium you are growing in, transplanting needs to be done carefully so you do not damage or shock your plants in this fragile stage.