



## How to Induce Polyploidy in Plants & Seeds via Colchicine.

**Introduction:** Polyploid plants often have desirable traits such as increased growth rate, larger blooms, higher alkaloid content and other qualities compared to the non-polyploid counterpart. Inducing polyploidy is also one method to overcome the sterility of a hybrid plant species.

### What you'll need:

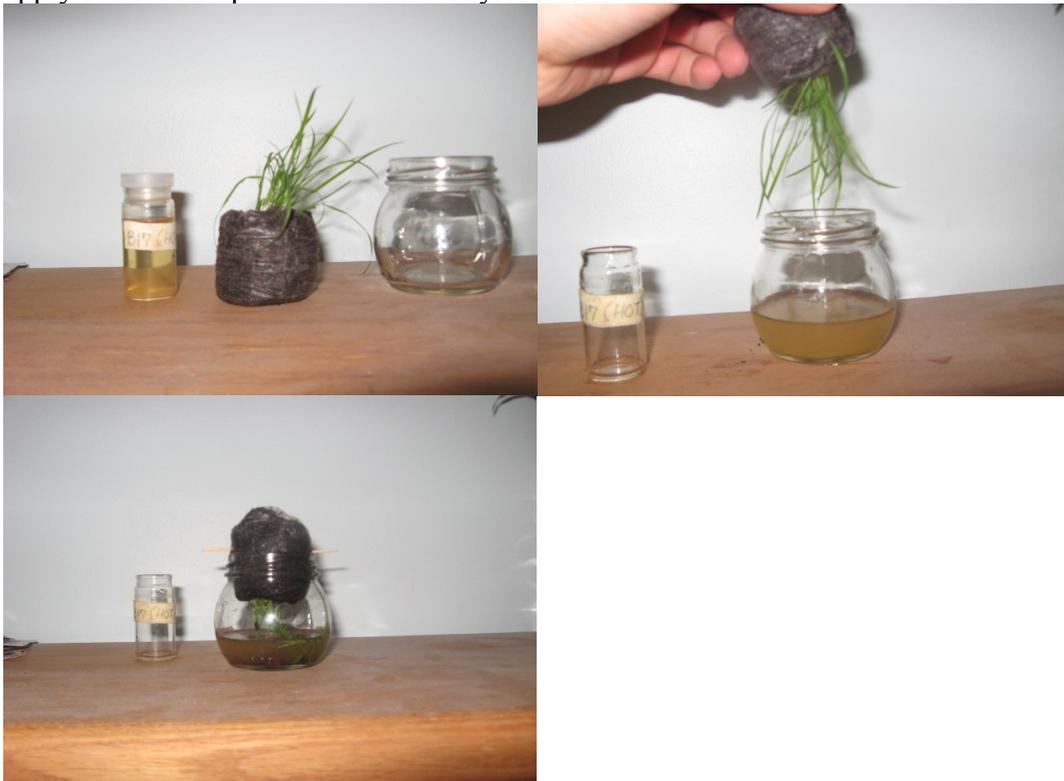
- Solution of Colchicine
- Plants, or Seeds
- Jar (to soak the plants in)
- Water

### By Way of Established Plants.

#### Step 1.

Soak the plant(s) upside down in a solution of colchicine. It is important to make sure you do not soak them too long, or let the colchicine solution touch the plants roots as doing both the former and later may kill the plant. If you did not soak the plant long enough only part of it will become polyploidy.

Since each type of plant is different, and the assumed homemade solution of colchicine varies in concentration as well, advice on how long to soak the plants cannot be given. Other variables will apply such as temperature and tonicity.



### Step 2.

Once the plant has soaked in the solution for the proper amount of time, take it out and rinse it once briefly with some clean water. This will take off the impurities found in the colchicine extraction which can cause problems later.



### Step 3.

Now that the plant has had the the colchicine solutions rinsed off, place it back into its normal growing conditions. Its growth will be stumped for several days because of the colchicine.

Left: Immediately after colchicine treatment. Right: two weeks after colchicine treatment.



### Step 4.

Since colchicine did not get on the roots, your plant isn't completely polyploidy. In order to get a completely polyploidy plant wait until it seeds or take a cutting. If you take a cutting, root and transplant it in to suitable conditions to assure its survival.

## By Way of Seed.

### Step 1.

Soak your seeds in a solution of colchicine. It is important to note that the faster the seed absorbs the solution, the less time it will need to be soaked. Seeds that are resistant to absorbing the solution may be nicked to encourage absorption. Soaking the seeds longer than needed will result in death. It is good to make sure the germination rate has been significantly lowered. A lowered germination rate will mean some of the seeds were killed by colchicine. This suggests that the other seeds that germinated have been exposed to a high level of colchicine and are more likely polyploids.



### Step 2.

Plant the seeds in the appropriate conditions. Since germination will take longer than the average seed, and the seeds will be weaker sprouts, it is important to prevent fungal problems. I have used pepper, cinnamon, and copper sulfate to prevent damp-off, which is caused by certain types of fungi.



Above is a picture of a few sprouts of *phalaris arundinacea* seeds treated with colchicine solution.

## By Way of Rooted Cutting or Sprout

**Note:** I have personally had very little luck with this method. The only time one didn't die with this method was with a small rooted *phalaris arundinacea*, which is a very hardy plant.

### Step 1.

Soak the rooted cutting or sprout in the colchicine solution. Smaller plants work better than large plants.

**Step 2.**

Rinse off the plant, put it in water, or in soil.

Here is the only plant that I have produced the cutting way. The plant is about a week or two after the colchicine treatment.



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