

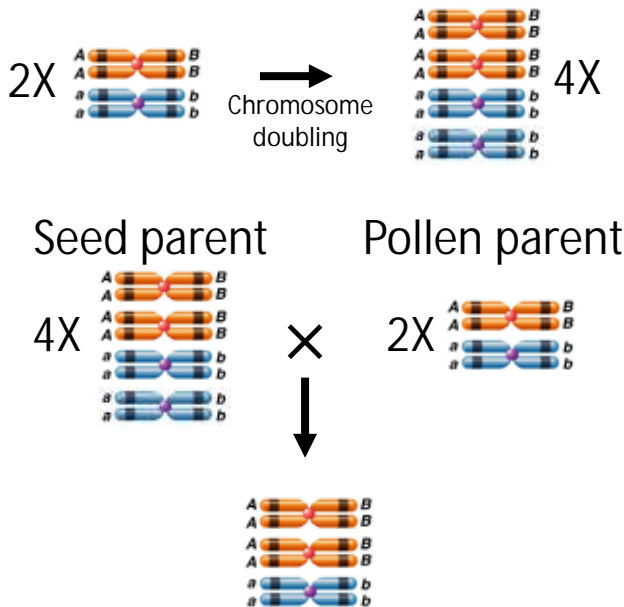
Cornell Hemp

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2021 Triploid Seedless CBD & CBG Trials

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The greatest yield of cannabinoids from hemp is produced from female plants that flower and remain unpollinated. Previous research in our group has shown a negative relationship between greater degrees of pollination (quantified by seed production) and decreased production of cannabidiol (CBD). The presence of seeds in flower biomass also resulted in unmarketable material for smokable products. Triploid cultivars should be sterile and should not produce any seeds even in the presence of nearby hemp pollen. If the production of cannabinoids from triploid cultivars is equivalent to that of unpollinated diploids, then cannabinoid hemp can be grown near grain or fiber hemp, avoiding conflicts between growers.



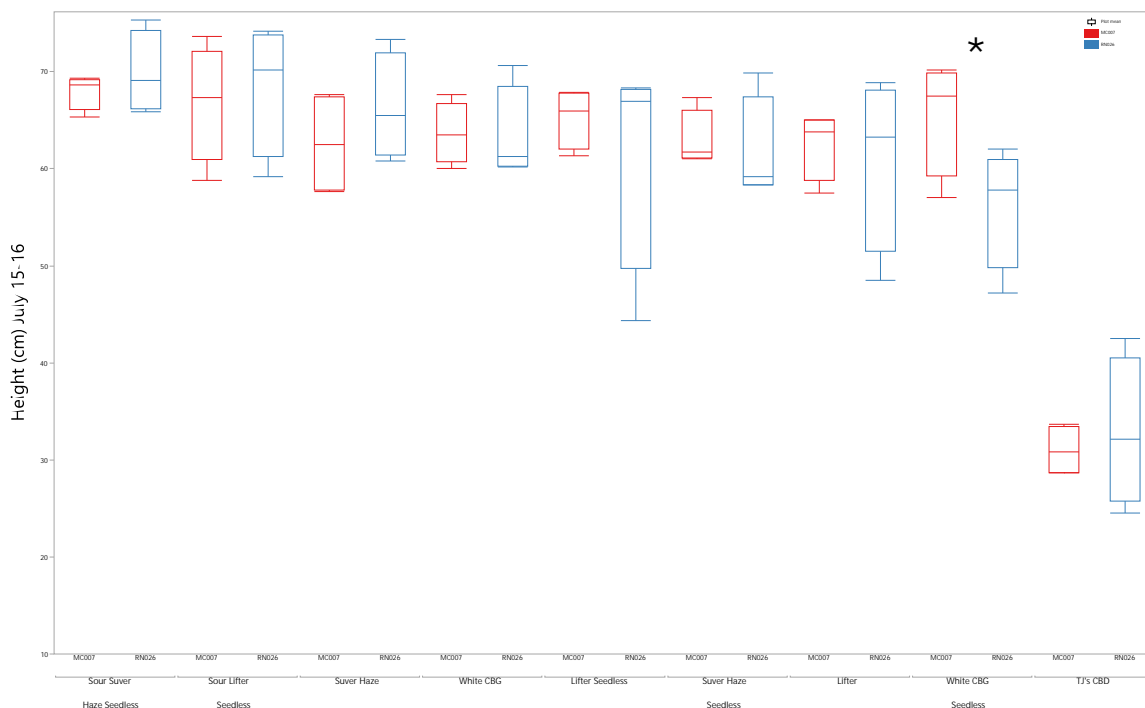
Seedless triploid hybrid (3X)

Triploids are produced by first doubling the genome of the diploid seed parent – using a chemical treatment to recover a tetraploid (4X) seed parent. That tetraploid (4X) seed parent is crossed with the diploid (2X) pollen donor to produce seedless triploid (3X) F₁ hybrid cultivars that are equivalent to their diploid counterparts, except having two copies of the chromosomes from the seed parent. Oregon CBD has accomplished this by doubling their suite of CBD and CBG seed parents and crossing them with their autoflower pollen donor to produce uniform F₁ hybrids.



Pairs of diploid and triploid equivalent cultivars from Oregon CBD were transplanted in five-plant plots from seeds started in a greenhouse in two trials that should not be challenged with pollen (McCarthy Farm in Geneva and Bluegrass Lane (BGL) Farm in Ithaca) and in a trial (Research North Farm in Geneva) that will be heavily challenged by pollen because it is immediately adjacent to our grain-dual purpose-fiber variety trial and near relatively large fields of dioecious and monoecious cultivars being grown for fiber. We will compare total cannabinoid production and seed yield in the pollen challenged plants with the cannabinoid levels in unpollinated trials.

Cultivar	Ploidy	Prop	Flowering	Source	McCarthy	BGL	Res North
TJ's CBD	Diploid	Cutting	Photoperiod	Stem Holdings Agri	X	X	X
Lifter	Diploid	Fem Seed	Photoperiod	Oregon CBD	X	X	X
Lifter Seedless	Triploid	Fem Seed	Photoperiod	Oregon CBD	X	X	X
Sour Lifter Seedless	Triploid	Fem Seed	Photoperiod	Oregon CBD	X		X
Suver Haze	Diploid	Fem Seed	Photoperiod	Oregon CBD	X	X	X
Suver Haze Seedless	Triploid	Fem Seed	Photoperiod	Oregon CBD	X	X	X
Sour Suver Haze Seedless	Triploid	Fem Seed	Photoperiod	Oregon CBD	X		X
White CBG	Diploid	Fem Seed	Photoperiod	Oregon CBD	X	X	X
White CBG Seedless	Triploid	Fem Seed	Photoperiod	Oregon CBD	X	X	X
Pine Walker Seedless	Triploid	Fem Seed	Photoperiod	Oregon CBD	X		
Sour RNA Seedless	Triploid	Fem Seed	Autoflower	Oregon CBD	X		X



Heights of the three middle plants in each plot were measured on July 15 and 16 for the McCarthy trial (no pollen) and Research North field 26 trial (pollen challenged). There were no significant differences in height between the two trials, except for 'White CBG Seedless', which was significantly shorter in RN026 than McCarthy.