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Hemp Mother Plant Considerations: Getting a good start for next season

Decisions made now can have a significant impact for next year's cutting (clone) crop.

Starting out with the best possible mother plants is the goal for a successful season. In North Carolina, around late July to early August, depending on cultivars is the time to make selections from any plants that are being grown under natural light conditions. Furthermore, it is advantageous to inspect mother stock plants closely to ensure they are free of any insect or diseases that will require control during the winter greenhouse production phase. Below are a few considerations to keep in mind as you can optimize your mother plant selections.

Daylength

With the day lengths shortening in the northern hemisphere, the critical photoperiod in hemp which initiates the change from vegetative (leaf) growth to reproductive (flowering) growth is occurring. The critical daylength trigger is between 14 and 14.5 hours of daylight, but appears to vary by cultivar (Hall et al, 2014). That normally occurs between 1 and 15 August in northern climates. Therefore, cuttings being taken for next year's mother stock which are growing under natural light conditions need to be taken soon.



Figure 1. A 12-hour day resulted in blooming plants (left plant). Night interruption from 10 pm to 2 am for 16 hours of total light (middle plant) is as effective to keeping mother plants vegetative as day length extension of a continual 16-hour day (right plant). Photo: NC State Research, cultivar Endurance.

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Implications for Mother Plants

With the summer field production in full swing, it is time to start planning for the next stage of cutting sales in the spring. Cuttings should be taken around the beginning of August and lit with long day conditions to ensure that they remain vegetative to size up. This can be accomplished by extending the daylength to 16 to 18 hours or by a night time interruption from 10 pm to 2 am (Fig. 1). No matter if a grower utilizes day extension or a night interruption it is imperative that plants do NOT experience a continual dark period which exceeds 9.5 hours.

Sulfur Evaporator

To ensure your cuttings for new mother stock are vigorous, avoiding overly stressed conditions is important. One such method to avoid nutritive stress is to provide sulfur (S) to plants via the atmosphere. Plants readily absorb S via the openings in the underside of the leaves (stomates).

Implications for Mother Plants

Historically for the past 100 years with greenhouse cut flowers, this has been done with a sulfur evaporator (Fig. 2). It works by heating the elemental S pellets until they are vaporized and the vapor is allowed to diffuse throughout the greenhouse. The idea is to cover the leaf surface as



Figure 2. Use of a sulfur evaporator with cannabis mother stock plants at the NC State University greenhouse. Adequate levels of sulfur are provided to the plants and the incidence of powdery mildew have been eliminated. Photo: Brian Whipker



Figure 3. Powdery mildew can be a major problem of cannabis. Photo: Brian Whipker

the plant grows. For a slower growing crop like roses, this usually meant that the evaporator only had to operate 2 or 3 times a week. For a faster growing crop such as hemp, additional nights may be needed.

To be effective, this is done at night when the greenhouse exhaust fans are not operating. Breathing the vapor should also be avoided. Because of these two factors, most sulfur evaporators are synchronized with the night interruption lighting that runs from 10 pm to 2 am. This way the vapor can be made available to the plants and then around sunrise, the greenhouse can be adequately ventilated to provide a complete air exchange.

Another added benefit besides providing a S fertilization to hemp plants is that evaporated S is very effective in preventing powdery mildew. In our research greenhouses at NC State University, we have healthy green plants and have totally eliminated our powdery mildew problems too! (Fig. 3) Please read and follow the instructions and precautions provided by the manufacturer before use. It is uncertain if the corrosive nature of the vaporized S can be used within enclosed indoor growing operations. Units and pellets can be purchased through greenhouse supply companies such as Fred C. Gloeckner, Global Horticultural in Ontario, and others.



Figure 4. Aphids can be found most often on the underside of the leaves. Photo: Brian Whipker



Figure 5. Thrips will feed on cannabis resulting in the above necrotic brown patches and stunted leaf growth seen above. Photo: Brian Whipker

A side note, vaporized S may have an effect on beneficial insects. Please refer to the chart linked here for more information.

<http://www.naturescontrol.com/pesticidewaitperiods.html>

Start Clean to Stay Clean

Whenever possible, prevention is the best management practice to use with hemp. This is especially true because of the lack of plant protection chemicals registered for application to the crop. Only take and grow cuttings from pest free plants.

Implications for Mother Plants

Inspect hemp plants for any insects, mites, or diseases when the cuttings are being taken. The use a 10X hand lens to look for aphids (Fig. 4), thrips (Fig. 5), spider mites (Fig. 6), and fungal spores (Fig. 3). In addition, broad/cyclamen mites (Fig. 7) and russet mites (Fig. 8) can be a major issue on hemp. These mites are almost impossible to see without an 80X microscope.

In our research greenhouses, we have found that washing the stock plants and cuttings with a forceful stream of water from the hose will dislodge a majority of the large sized pests. This most likely will not eliminate thrips eggs which are laid inside the leaf or mite eggs. Because hemp cuttings wilt so quickly after they have been cut, we hydrate the cuttings in water for around 10 minutes. To this soak water we add 1 ml of dish soap to 1 liter of water. This helps to avoid wilting, eliminates the leaf surface tension so that any air pockets are removed (which very effectively drowns most adult insects such as aphids) and cleans off any dust particles. [A word of caution, there are a number of bacterial diseases that can infect hemp. If a bacterial disease problem is suspected, do not soak your cuttings in container of water to avoid cross contaminating all of your cuttings.]

Eliminate Weeds in the Greenhouse

Weeds growing in the greenhouse are a main infestation source for many insect and mite pests (Fig. 9). In our greenhouses at NC State, we are always removing any sprouted weeds. Much to our surprise, many of these weeds also contain a stray aphid, whitefly, thrips or spider mite despite the low weed population within the greenhouse.

Implications for Mother Plants

Eliminating those weeds a few weeks prior to bringing in your hemp mother plants will help avoid future pest problems.

Summary

To aid in your success of producing next year's hemp cuttings, steps you take now will help you avoid many future problems. That is why is it always best to start off clean to be able to stay clean with hemp mother plants.

Literature Cited

Hall, J., S.P. Bhattarai, and D.J. Midmore. 2014. The effects of photoperiod on phenological development and yields of industrial hemp. *J. Natural Fibers* 11:87-106.





Figure 6. Spider mites can be a significant pest of cannabis grown in a greenhouse. The fine webbing as seen above at the base of the petiole and leaflets indicates a major population outbreak. Photo: Brian Whipker



Figure 7. Broad and cyclamen mites can cause distorted new growth of cannabis. Photo: Brian Whipker



Figure 8. Russet mites can also be a major pest of cannabis. It takes an 80X microscope to view them. Photo: Brian Whipker



Figure 9. Weeds left growing in the greenhouse can be a major source of insect infestations for a hemp crop. Photo: Brian Whipker



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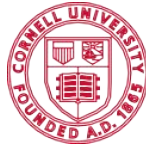
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