

Comparison of Peat-Based Planting Media to Sustainably Produced Planting Medias: Watering and Other Considerations

Introduction

We depend on healthy soil to grow the food we all eat. However, like all natural resources, soil fertility can be depleted over time. Without healthy soil and sustainably produced amendments to keep soil healthy, our food production system will be threatened. With so much at stake, it is important that research is done not only on the existing soil, but also on the creation of new soil material. In Western Kentucky, we are uniquely situated to address this issue as our region has a surplus of potentially beneficial soil amendments available at low to no cost. This research looks specifically at a planting media that incorporates wood chips, Asian Carp, and poultry litter. By completing this research, researchers are actively addressing the questions that haunts all agriculturalists: will we be able to feed the projected population of 9.8 billion people in 2050? Without healthy soil, we may not be able to.

Conceptual Framework

Throughout the years, there has been several different studies that play a part into the creation of the highly sustainable mixes that I have researched this semester. Using biochar to add nutrients back into the soil has been practices for eons. Historically, farmers would to burn their field after a number of years to maintain a needed nutrient level among their soil - however, this practice can be dangerous and pollutes our air.

There has also been much research on how to create soil that has the correct proportions of Carbon to Nitrogen. The ratio that is need - 25:1 or 35:1 - has never successfully been created since there has never been a means to consider the soil "living". Yet with the soil that I have been testing, it is proven to have the exact ratio needed to create the perfect environment for microbes to survive in once water has activated the soil.

Methodology

My research consists of testing the results of brussels sprouts growth in three different soil mixes in two separate replications. We used two planting medias currently under development for commercial production. Both mixes are manufactured by a company in the region using sustainably sourced Asian Carp, poultry litter, and wood chip material. We used a Starter Mix and an All Purpose Mix. We used Pro-Mix, the "standard" mix in this industry as a control. I planted two nine packs of brussels sprouts in each treatment and one six pack in the control media. During the first replication, I watered from the bottom. During the second replication, I watered from the top. All iterations were grown under grow lights indoors in an indoor setting.

Results / Findings

When I started my research, I had no plans to do two separate rounds of brussels sprouts. However, during the first round, there was no growth from the All Purpose Mix. Not one single seed germinated in the nine pack that I had planted, whereas in the other two mixes, there was obvious germination. The Starter Mix had 3 seeds germinate in the nine pack and the Pro-Mix had 4 seeds germinate in the six pack. After seeing these results, the thought was that the All Purpose Mix was not able to absorb enough water from the bottom because of the particle size of the mix, so I decided to test that theory. Once Round Two was started and each mix was planted in a six pack, there was no watering from the bottom, but from the top only. Better results were recorded for both the Starter Mix and the Pro-Mix with each of them having 5 seeds germinate in the six pack. However, there was still no growth from the All Purpose Mix in Round Two.

Conclusions

This pilot research found that overall, seeds planted in the control performed better than seeds planted in either treatment, regardless of watering protocol. An additional replication is planned using Started Mix with mechanically reduced particle size. Theoretically, reduced particle size should increase seed-to-soil contact, and increase the availability of water to seedlings on a microscopic level. Further research is needed to develop watering protocols for both treatment mixes.

Recommendations

After reviewing the results from my research, I would recommend using the Starter Mix and watering from the top. Better results were shown in Round 2 when this was the method used. While Pro-Mix did have favorable results in Round 1, it has been proven through the research that the Starter Mix is just as reliable when watered correctly and it is a more sustainable product to grow crops in.

References

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