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## **Mitchell Domes Hemp Clone Feasibility Overview Analysis**

**To:** Milwaukee County Parks Executive Management

**From:** Wisconsin Growers Alliance

**Report Prepared By:** R.B. Mack Consulting Inc. with assistance from Tyler Dowd, PhD and Carola Dowd, PhD/MBA

### **Proposed Agenda Item for Milwaukee Legislature - Sept 2019**

**Purpose of Report:** Analyze the feasibility and financial viability of utilizing a portion of the greenhouses at the Mitchell Park Domes for hemp clone production.

Wisconsin lost an estimated 700 dairy farms last year, due to overproduction and falling export markets which sent wholesale prices plummeting. This downturn has an increasing number of Wisconsin farmers looking to capitalize on this newly emerging market.

The 2018 Farm Bill legalization of hemp production for industrial purposes has been a major incentive for farmers and researchers to procure new opportunities with the valuable crop. As a result, the market for hemp is expanding to include a large quantity of products such as CBD, consumer textiles, renewable paper, food, and personal care items. Furthermore, the global and national market prices of the hemp commodities are seeing notable annual increases in the price of seed, young identical plants (clones), and full-grown plants (raw biomass). Just looking back 2 years to 2017 the market price of biomass for seed and fibers has increased from \$1.00/%CBD/pound to \$4.02/%CBD/pound, a 400% increase. Clones are currently sold at an even higher price (\$5.42/unit).

A previously rejected proposal used information from at 2017 Cornell university report which, as described above, was outdated due to the quickly rising price of the hemp commodity. Furthermore, while the Cornell Study did have some limited relevant market data for areas in the United States, such as the statistics given for 2017 biomass above, the data presented in the previous proposal was pertaining to Alberta Canada,



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an area with a significantly different potential market compared to Milwaukee. Even more problematic, the previously submitted proposal did not convert the reported Canadian market values in the original Cornell University report from Canadian Dollars (CAD) to United States Dollars (USD), leading to the information presented therein to be further confused with improper figures. While the conversion of CAD to USD would lead to deflated values for the predicted profit of the 2017 hemp market price data, it also results in a significant over estimation of production costs compared to USD on the order of 25%. This leads to an improper estimate of the true financial viability of hemp production at the Mitchell Domes Greenhouses while the value of the crop has a 400% increase, the production costs remain unchanged compared to two years ago. Therefore, the economic viability for the operation, as well as the benefit to farmers, needs to be reassessed with recent USD figures to have a true understanding of the potential financial benefits of the area.

While biomass hemp production is a very active market nationally and worldwide, a more productive and beneficial system could be implemented at the Mitchell Park Greenhouses in Milwaukee by moving focus away from biomass production and onto the propagation of young hemp clones. Utilizing a 5100 ft<sup>2</sup> greenhouse space to propagate and care for hemp clones has many advantages compared to the production of biomass hemp. Firstly, the current ARGUS environmental control system would be sufficient for clone production, requiring minimal modifications and additional equipment to operate at an optimal capacity.

Additionally, the biological processes and metabolic pathways responsible for seedling maturation and development to the size of full-grown hemp plants are highly dependent on the plants sensing of seasonal variation. This requires substantial modifications of internal greenhouse growth conditions as the seasons progress, as well as a considerable amount of environmental control manipulation and maintenance; as well as additional equipment such as supplement lighting. A benefit of using the space for clone production is a simplified lighting cycle could be used as the plants will remain in the seedling stage. This would not require modifications with plant development, could be easily standardized to run smoothly and indefinitely with the ARGUS system, and would require significantly less oversight of environmental conditions.



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Clone production is significantly faster than growing for biomass and the suitability of safely and quickly producing clones for farmers, as well as the disease management practices therein, have recently become an extensively researched topic. Furthermore, many institutions have begun optimizing practices for not only clonal propagation but also pest and microbial control and treatment. Seedlings two weeks old can be produced rapidly with exceptionally quick turnover. This allows for large volumes to be readily available for local farmers who are better suited to grow hemp biomass in the volumes that would be financially viable. Providing farmers with clean, disease free clones of known and tested genetic purity would be a great resource for farms interested in hemp production and would provide a sense of security that the clones were of high quality, were true to the genetics of the desired variety, and don't pose a threat of introducing pests into their fields.

Furthermore, a clone growth infrastructure would allow for the implementation of vertical farming in the future to vastly improve the capacity of plants being grown simultaneously. This would be an excellent way to facilitate future expansions and improvements, increasing productivity and profitability of the space used all while taking up the same amount of ground floor space.

The restricted size of the Mitchell Park Greenhouses are well suited for the propagation and control of disease-free hemp clones with the current infrastructure already on site. This resource for local farmers would be able to stimulate the farming economy as additional markets open up to them.

To develop an accurate set of projections the current operating expenses should include utilities, personnel and maintenance schedules for the subject site. Due to the limited amount of information available on expenses, the benefits of this propagation program for clone sales will focus on the production capabilities of the square footage allotted. The bench production configuration in this operation allows the plants to be lined up in a dense formation. Multiple certified hemp strains will be duplicated and tracked for consistency from clone to sale.

Field tests will be performed to create a baseline model to establish recovery rates after cloning from mother plants. Recovery time may differ depending on the



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specific strain. In addition, different strains will have different production capabilities due to their natural growth characteristics.

Once field tests have established the production capabilities of each strain, the majority square footage of the greenhouse will be filled with “mother” hemp plants. Upon completion of this phase production cloning can begin. The setup time required to achieve this will take a minimum of 4 to 6 months. To prepare for the 2020 growing season it is imperative that the operator of this project begin assembling the various certified strains that will be used for the “mother” plants immediately. The lead time to achieve an optimum cloning workflow is paramount to maximizing revenue in the 2020 season.

Once the greenhouse is full with mature “mothers” the cloning process can begin. Each plant can initially provide 30 to 50 clones. The recovery period will take approximately 3 weeks from time of taking clones from the “mothers.” The clones will take between 2 and 3 weeks to root, at which time they would be available for sale.

The continued vegetative growth of these plants will allow exponential increases in clone production from each plant.

For example: 800 plants producing 50 cuttings each allows for 40,000 starter clones to be planted. If we conservatively assume a 30% failure rate built into the calculation then 28,000 rooted clones can be produced within 3 to 4 weeks. Wholesale sales of this round of production could yield \$140,000 gross monthly sales, \$1,680,000 annually. Souvenir plants can also be sold on a retail level for a higher amount per plant but will be lower volume.

Seasonal demand and focused marketing on large scale biomass growers should be a consideration for developing annual sale estimates.

To maintain a safe environment for initial 40,000 starter clones and further expansion/production the underutilized refrigerated space in the greenhouse facility should be modified and used as a clone nursery.



The existing space will require modifications, equipment, environmental controls, airflow controls and filtration systems that create an ideal propagation area for clone production. This capital investment can be provided by the private operator without requiring any additional funds from the county.

The capacity of this space can easily exceed 40,000 clones with significant room for continued monthly planting. This “propagation area” should be the nursery for starters before going to market. Disease free, strain specific plants are essential for successful hemp farming. These plants must have certificates of authenticity that track their origin, potency and ensure their legal THC limits as required by the 2019 Farm Bill.

Milwaukee Parks and Recreation has approximately 880 acres for private agricultural farming leases. The proposed dome greenhouse clone project could provide clones for hemp biomass cultivation on some of these properties. This would provide additional revenue and support the greenhouse project while encouraging urban farming. Hemp biomass income exceeds traditional crop income based on current market prices.

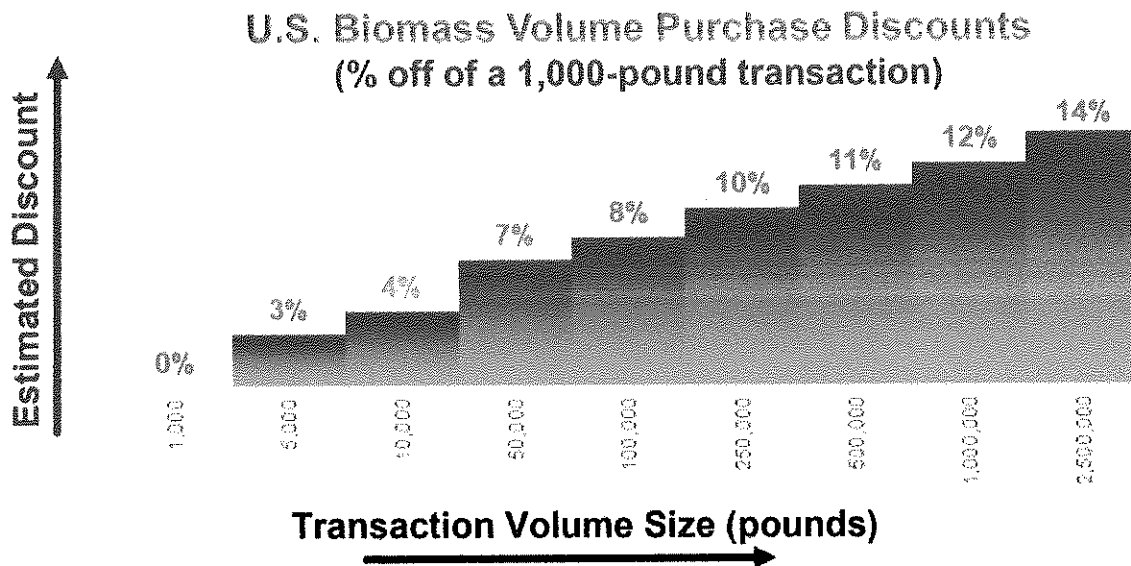
According to the *Successful Farming* article, “What Farmers Need to Know About Growing Hemp,” CBD farming is done at a rate of “1,000 to 1,600 plants per acre,” which are, “planted and tended to as separate plants.”

1,600 hemp plants per acre yielding one pound per plant with a CBD percentage of 11% using the conservative sale price of \$42.00 per pound would bring \$67,200 in gross revenue per acre. Current prices per acre of corn produces 220 bushels at current market price of price of \$3.66 (*Source: macrotrends.net*) will bring \$805.20 gross revenue per acre for comparison.

### Hemp Commodity Market - June 2019

U.S. Region Products	Units	Assessed Price	Low	High
Biomass (0 – 25k pounds)	\$ / %CBD / pound	\$4.02	\$3.00	\$5.87
Biomass (25k – 100k pounds)	\$ / %CBD / pound	\$3.61	\$3.00	\$4.00
Biomass (100k – 1M pounds)	\$ / %CBD / pound	\$3.57	\$3.20	\$4.00
Biomass (1,000,000+ pounds)	\$ / %CBD / pound	\$3.52	\$3.00	\$3.88
Dry Flower (Bulk)	\$ / pound	\$349	\$70	\$700
Clones	\$ each	\$5.42	\$2.50	\$8.00
Industrial Seeds	\$ / pound	\$2.68	\$1.19	\$3.96
CBD Seeds (Non-Feminized)	\$ / pound	\$3,611	\$2,500	\$7,500
CBD Seeds (Feminized)	\$ / pound	\$24,491	\$18,000	\$32,000
Crude Hemp Oil	\$ / kilo	\$2,066	\$1,350	\$4,500
Refined Hemp Oil	\$ / kilo	\$5,628	\$2,500	\$10,300
CBD Isolate	\$ / kilo	\$4,811	\$3,600	\$6,600

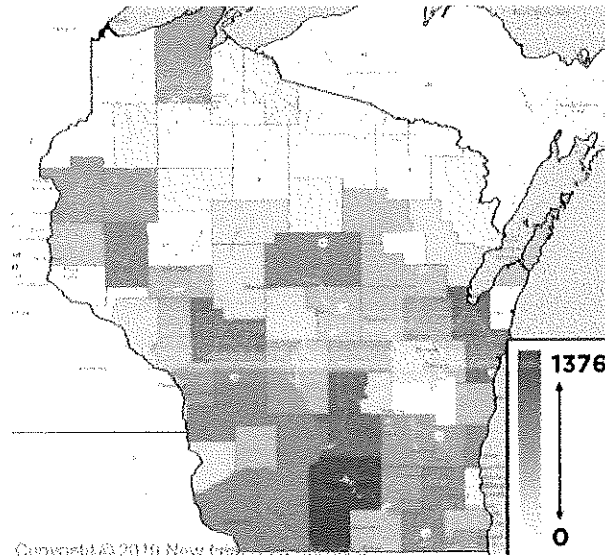
Source: Hemp Benchmarks Market Report - June 2019



Source: Hemp Benchmarks

## Registered Hemp Farmland in Wisconsin as of June 2019

Source: Wisconsin Department of Agriculture



- ❖ 16,100 acres are currently registered as 2019 growing locations
- ❖ About 151 acres of hemp have been reported as planted in Wisconsin as of mid-June
- ❖ 1,490 applications for Wisconsin hemp grower licenses
- ❖ 1,314 grower licenses have been issued to Wisconsin farmers

### Conclusion:

A portion of the greenhouses at the Mitchell Domes can be converted to a profitable private/public partnership with no upfront costs to the county of Milwaukee. A profit sharing arrangement will provide significant revenue that can be utilized for the revitalization of the Mitchell Domes. In addition, the clones produced from this partnership will enhance Wisconsin hemp growers ability to produce high quality biomass. This program will be beneficial for large scale farmers to urban farming hobbyists.

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