Department of Agriculture, Trade and Consumer Protection
Division of Agricultural Development
Agricultural Development & Diversification Program (ADD)
Grant Project Final Report

Contract Number: 24083

Grant Project Title: Maximizing the productivity of NFT potato seed minitubers

Amount of Funding Awarded: $25,000

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Please focus on the Wisconsin Agricultural Industry as the primary audience for your grant project final report. The following questions are meant to be a guide for writing your grant project final report. Your final report will be shared with the Agricultural Industry and can serve as a template for further growth and development for the State of Wisconsin. Please provide them with the best report possible. If we can help in some way, please let us know.

1) What was the original intent of the grant?
   The goal of this project is to develop storage and crop production practices that optimize yield and tuber number of first field generation of potato seed grown from NFT minitubers.
   - What did you want to accomplish with the grant?

   1. Identify storage management techniques for hydroponic minitubers that break dormancy and optimize crop productivity.
   2. Develop pre-plant chitting and curing strategies that optimize NFT minituber vigor, stem set, and tuber set.
   3. Optimize planting density for NFT minitubers to maximize number of seed units and yield per acre

   - How was it expected to benefit Wisconsin Agriculture?

   NFT minitubers reduces generation time for virus cleanup to commercial seed production. NFT minitubers provide an opportunity to reduce disease in certified seed potatoes and potential means to improve the efficiency of early generation seed potatoes.
   - What steps did you take to reach your goal?

   We conducted field trials to evaluate the influence of plant density on tuber set and yield of NFT minitubers to address objective 3. We initially requested 2 years funding and only receive one year funding. This reduced our capacity to complete research related to objective 1 and 2. We are doing smaller scale trials to meet needs of objectives 1 and 2, but these are going slowly.
   - What makes this project work important or significant to the State of Wisconsin or Wisconsin Agriculture?

   Disease free seed is the foundation of the Wisconsin potato industry. NFT minituber are being grown by 3 private farms besides the Foundation Seed Farm. NFT minitubers could improve the production efficiency of the seed farm reducing input costs to the nearly 20 potato seed farmers in the state. Disease free seed of varieties such as Russet Norkotah, Silverton, or others prone to PVY improves seed quality and performance in commercial potato fields. This improves productivity and ability to tolerate stress increasing sustainability of potato production.

2) What were you able to accomplish?

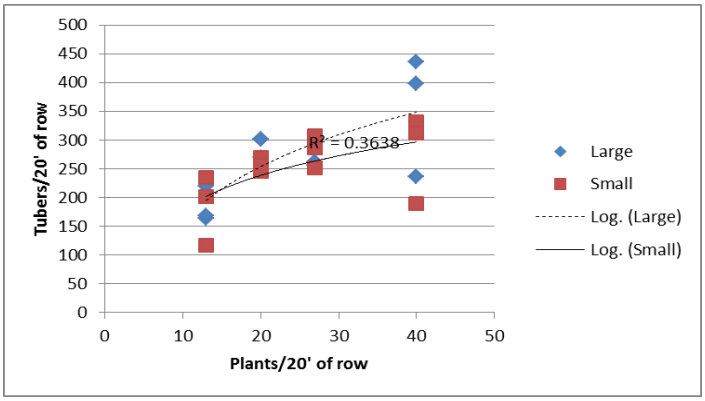
- Please share any appropriate project results and other information beneficial to Wisconsin Agriculture.

-NFT minitubers set well for Red Lasoda and Atlantic, but there were fewer tubers per plant for Russet Norkotah

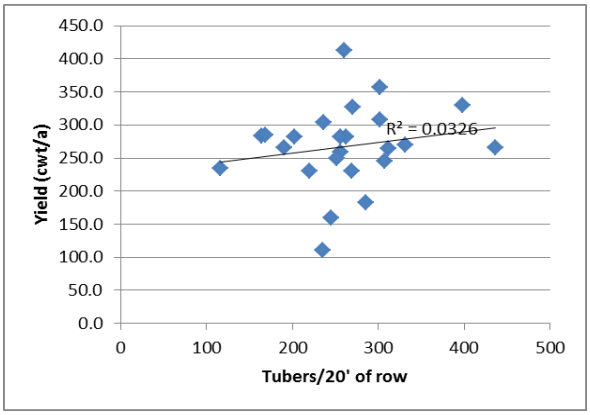
-minituber size did not seem to impact tuber set or yield much

-Small minitubers need to be managed for skin set and breaking of dormancy especially for varieties such as Atlantic or others that do not germinate well when spring planted.

- Include any analysis of data collected or materials developed through project work.



Tuber density increased with planting density. However, tubers per plant increased at wider spacings. Increasing tubers per seed piece is advantageous over increases in yield due to high cost of seed relative to production costs per acre. Analyses will continue to evaluate economic return based on NFT seed purchase and production cost per acre. NFT seed costs $0.50 per minituber (plant). Production at 18" in row spacing was $0.15 per plant.



Yield did not respond density suggesting constant, but variable yield across treatments. Minituber seed size was irrelevant.

3) What conclusions can you make based on project work the analysis of collected data?

-Seed costs per plant are 5 times greater than production costs per plant.
-Spacing plants at less than 18" within the row starts to reduce tuber set.
-Field production of NFT minitubers should be done at 18" in-row spacing

4) What do you plan to do in the future as a result of this project?

Research is continuing in multiple ways. NFT minituber production on the State Seed Farm has increased dramatically and requires a 30 to 100' greenhouse to produce the minitubers and will continue to expand. This resulted in clean Silerton seed (no virus detected in variety that masks infection).

5) What information or additional resources are needed to commercially develop this enterprise?

Documented savings in first generation NFT minituber production could promote this technique quickly across the Wisconsin Seed Potato Improvement Assocation. Second year funding to help optimize storage management of several NFT clones.

6) How should the agricultural industry use the results from your grant project?

Potato seed growers are using this information in guiding foundation seed production. 3 to 5 farms continue to plant NFT minitubers and they ask for advice.