Growing Taro in West Virginia

Domingo Mata Padrino, Eugenia Pena-Yewtukhiw, Mirjana Bulatovic-Danilovich and Sven Verlinden

Introduction:
Climate variability affects food production directly by influencing growth and development of crops. New crops and varieties should be tested in agroecological conditions and hardiness zones outside of their natural growth environment. Low-input and small farm production systems might be the way to expand and diversify production by introducing and adapting tropical crops into the temperate-zone environment.

Objectives:
Evaluating the feasibility of taro *(Colocasia esculenta)* production under WV agroecological conditions.

Materials and Methods:
The experiment was conducted with the objective of evaluating the feasibility of taro (*Colocasia esculenta*) production under WV agroecological conditions and low-input fertilization impact in organic and conventional production systems from 2018 to 2021.

- Experimental Design: Completely randomized design (2 replications, and 12- plants/plot).
- Management:
  - Fertilization was applied based on soil test results.
  - The weed control in 2020: mower in the organic system and glyphosate in the conventional system.
  - The variety used was selected from commercial cormels planted and harvested for three years in the WVU greenhouse and organic farm.

Results and Discussion:
Fertilization increased the number of shoots per plant and the total above-ground biomass (Figure 2) but did impact on yield (Figure 1). The results show similar yield in both production systems. Once the plastic cover was replaced with the traditional weed control, the observed differences could be explained by the change in the environmental conditions (warmer soil under the plastic; Figure 4). Research conducted under tropical conditions show trends similar to what we observed (Onwueme and Charles, 1994; Torres et al., 2000; Valverde et al., 1997; Igbokwe, 1983)

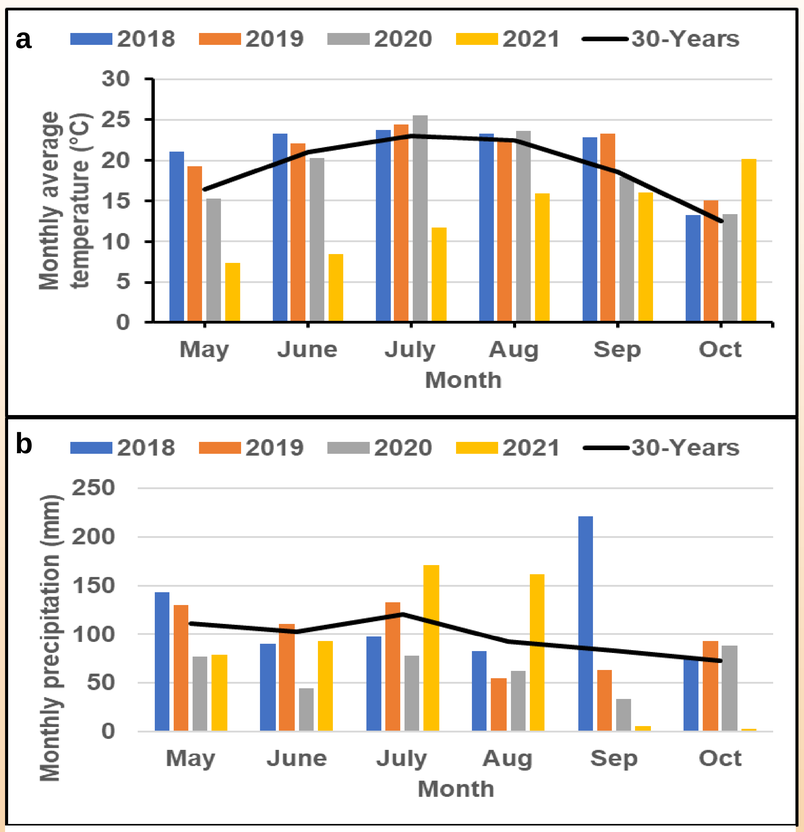

Figure 1. Monthly mean temperatures (**a**), monthly mean precipitation (**b**) and 30-year means at Morgantown

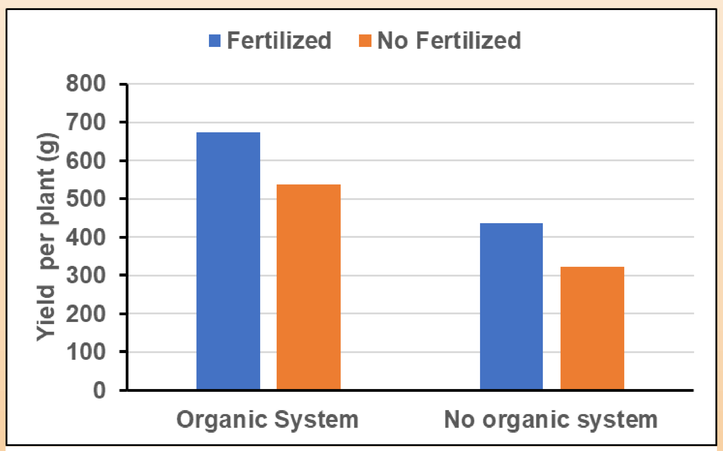

Figure 2. Effect of fertilization on Yield per plant.

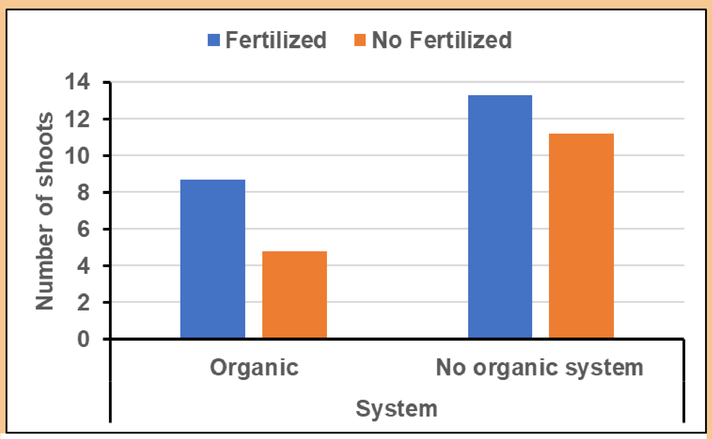

Figure 3. Effect of fertilization on Number of shoots per plant.

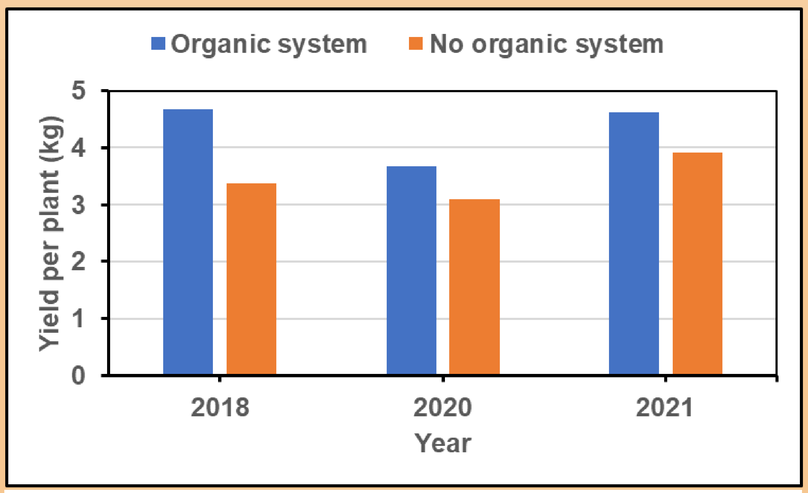

Figure 4. Production per plant over three years

Conclusions:
Fertilization affects the proportion of yield gain per shoots produced, it is higher in the organic system.
Our results support hypothesis that tropical crop production could be expanded in the temperate regions by implementing appropriate technology on small farms with low-input production systems.

Recommendations:
Based on our experimental results, topics for future research are: effects of organic soil matter on growth and yield, fertilization and weed control methods, and economic feasibility and consumer preferences.

Acknowledgments
This project was conducted with funding from Hatch. The authors thank the various students, the organic farm and greenhouse crews for their help in establishing, maintaining and harvesting this series of experiments. The contributions made by Mr. Fred Gifford, Ms. Teri Koster, Mr. Mark Satterfield and Ms. Claire Sweeney are especially appreciated.