Pairing Aquaculture with Agriculture;

sustainable fish, vermiculture, and insect rearing at Forestdale Farm to improve revenue, yields, and soil health

Catfish Production

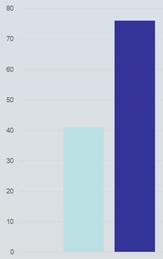


Catfish and measuring board at the start of the experiment

- **Catfish are a hardy fish that can be sustainable managed on small farms. The waste from rearing these fish is an excellent nutrient for plants and soil health. In addition, catfish can be sold as a marketable commodity increasing revenue.**

Soil Health

Difference in total Nitrogen (PPM) from the start to the finish from treatments with and without fish



The treatments watered from tanks without fish had significantly greater nitrogen loss, almost 50 percent, than treatments with fish. Plants in treatments irrigated with fish water do not have to use up as much of the nitrogen in the soil, which leads to healthier soil and healthier plants

Total Nitrogen ppm. Difference from start to finish

Treatments with fish Treatments without fish

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Crop yields

- **Leafy green production was consistently higher for each variety (Arugula, Mizuna, and lettuce) when watered from tanks containing fish.**



An overview of the catfish pond and experimental beds on the farm

Red Wiggler and Mealworms A sustainable fish food



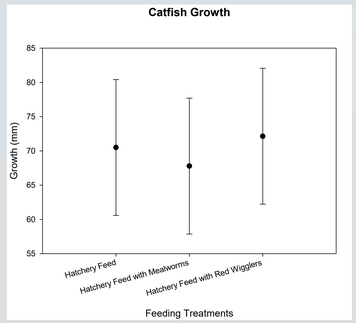
Mealworms raised and used in feed treatment



Red wigglers raised and used in feed treatment

- **Mealworms and Red Wigglers are good options to rear on farms to create sustainable feed sources for fish production. We noticed red wigglers were much easier to establish and harvest and saw the biggest benefits with them**

Catfish Growth



- **Both Mealworm and Red Wiggler treatments showed a similar fish growth compared to hatchery feed.**

FORESTDALE FARM
FLAGSTAFF ARIZONA