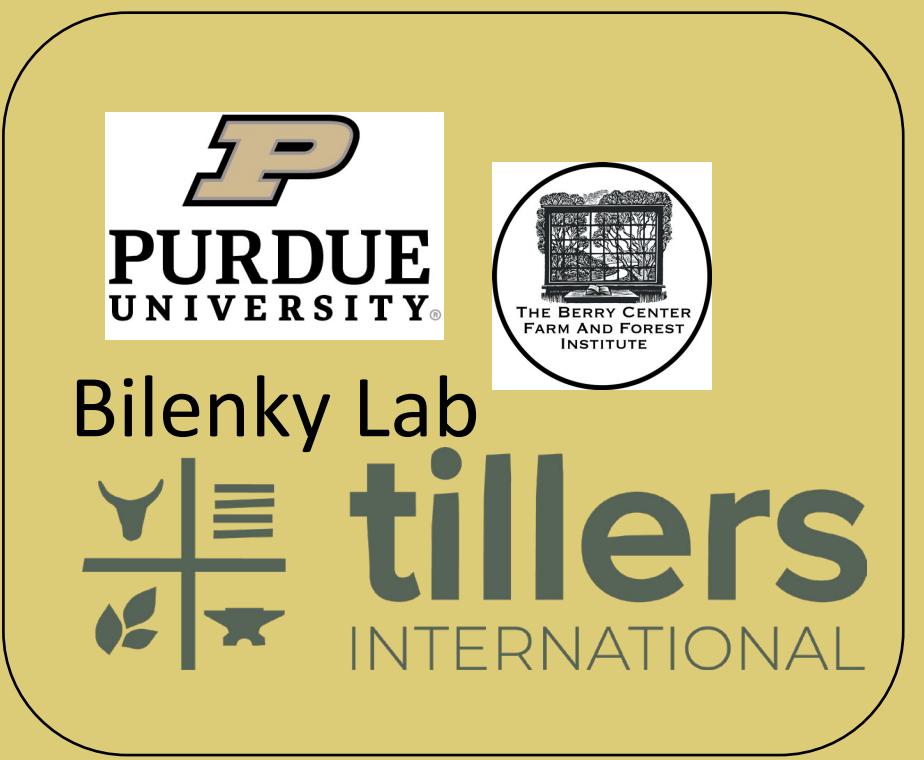


Addressing Knowledge Gaps in Animal Traction on Vegetable Farms and Woodlots in the Midwest

An NC-SARE Partnership Project

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Introduction

Despite not well studied within the sustainable agriculture research community, there is evidence that animal traction could be a regenerative power option for small farms. Animals cause minimal compaction, appreciate, and can regenerate. Fuel can be grown on farm, some animals are multi-purpose, and there is social benefit for those that interact with them. However, opportunities for aspiring teamsters to gain knowledge are limited. Extension materials and programming from public Universities are also not widely available. Therefore, the objectives of this project were:

- **Objective 1:** Provide hands on and intensive training on animal traction methods for market gardeners and woodlot owners in the Midwest through a collaborative effort among the Sustainable Horticulture Lab, the Wendell Berry Farm and Forest Institute, and Tillers International.
- **Objective 2:** Implement animal traction-based research and demonstration plots at Purdue University
- **Objective 3:** Together with each farmer partner create an individualized economic based animal traction integration plan and extension materials.

Objective 1

Aspiring draft animal powered farmers were provided with the opportunity to attend hands on classes to develop draft animal handling skills, increase knowledge of equipment operation, and increase awareness of what is possible with draft power.



Figure 1a. As a result of the project mother daughter and father son farmer partner duos participate in hands on classes at Tillers international in Summer 2024 and at the Wendel Berry Farm and Forest Institute in Winter 2025. A). Farmer partners Jennifer and Laurelyn attend farming with draft horse short course at Tillers International; B) and C) Vincent and David work their new team of oxen purchased in part as a result of this project; D). Rick Thomas teaches oxen skills at the Wendel Berry Farm and Forest Institute.

Objective 2

Completion of year one of the side-by-side tractor-animal traction comparison at the Meigs Horticulture Facility, included the comparison of two treatments animal traction (AT) and tractor traction (TT) for potato production. Treatments were planted on June 12th. Hilling occurred on 20, July (AT and TT) and 3, August (AT only). Harvest occurred on 30, September (AT) and 11, October (TT).



Figure 2a. Animal traction field activities from the side-by-side, randomized and replicated tractor-animal traction comparison at the Meigs Horticulture Facility 2024. A). Percheron team used for planting and hilling in the animal traction treatment; B). Potatoes in the hopper; C). Planting using horse drawn potato planter; D). Hilling using McCormick straddle row cultivator; E). Harvesting using mules and walk behind potato plow.

Table 2a. Costs of tractor and animal power machinery used in the side-by-side trial.

Machine/Implement	Cost USD \$	
	Animal Traction	Tractor Traction
Potato planter	-	2,320
Hiller	350	-
Potato digger	100	9,827.30
John Deere 5055 E, 55 HP		30,000
Forecart	1,600	-
Team Percheron horses	15,000	-

Table 2b. Time in the field for each field activity

Field Activity	Time in the Field (mins)	
	Animal Traction	Tractor Traction
Planting	60	30
Hilling 1	45	20
Hilling 2	45	-
Harvesting ¹	240	60



Figure 2b. Tractor traction field activities from the side-by-side, randomized and replicated tractor-animal traction comparison at the Meigs Horticulture Facility 2024. A). Tractor and potato planter used for planting in the tractor traction treatment; B). Tractor and potato digger for harvesting potatoes in the tractor traction treatment.

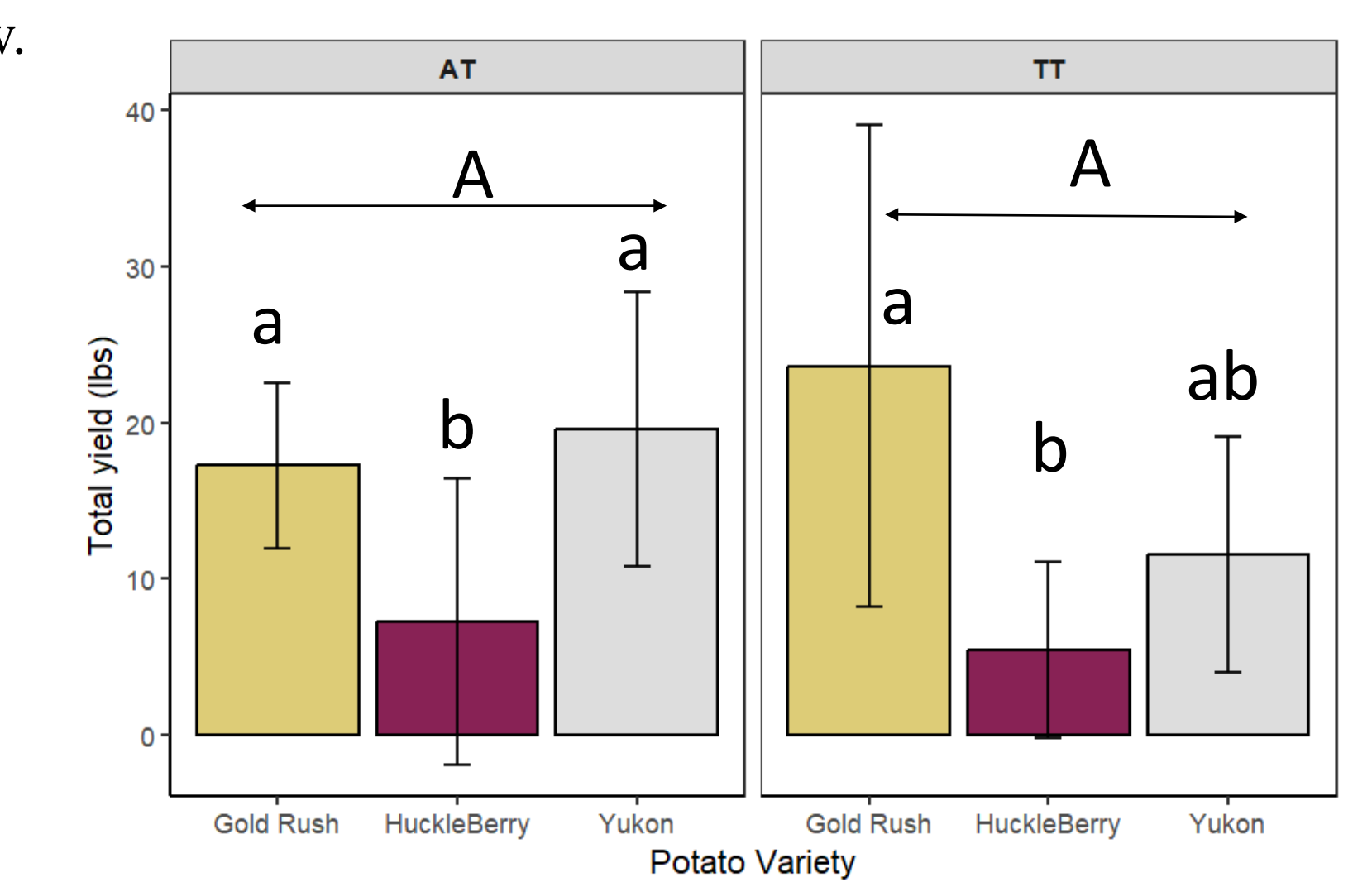


Fig 2c. Total potato yield from AT (animal traction) and TT (tractor traction) treatments. Upper case letters that are the same indicate no statistical difference between AT and TT at $P \leq 0.05$ according to Tukey HSD. Bars: +/- standard deviation.