

## Liquid Digestate Fertigation Demonstration Results on Two Potato Varieties

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In collaboration with our partners at [Vashon Bioenergy Farm](#), Organic Farm School demonstrated liquid anaerobic digestate injected into our drip irrigation system (fertigation) on two varieties of potato. This side-by-side trial was on two 100-foot beds. Each of the two beds were planted with 50 feet of the variety *Russet* and 50 feet of the variety *Adirondack Blue*. By splitting the beds with the two varieties, we could observe and measure any differences on both varieties with, and without digestate in the drip irrigation. We measured number, weight, and marketability of potato tubers for both varieties. Plants during the season were noticeably taller and endured much greater weed pressure in the digestate treated bed (see Fig. 1) - weeds love digestate too! Tuber numbers and total fresh weight (see Figs. 2 and 3) were not indicative of treatment because treatments began after potato emergence and there were many skips in the digestate treated bed (we flipped a coin to decide which bed received digestate). Average tuber weight was greater for *Adirondack Blue* in the digestate treatment as compared to the control whereas the opposite was true for *Russet* (see Fig. 4). Interestingly, the marketability of the *Russets* in the digestate treated bed far exceeded those of the control treatment (see Figs. 3, 5 and 6).



Fig. 1. Digestate fertigated bed (left) displaying taller top growth and much more intensive weed pressure as compared to the control bed (right).

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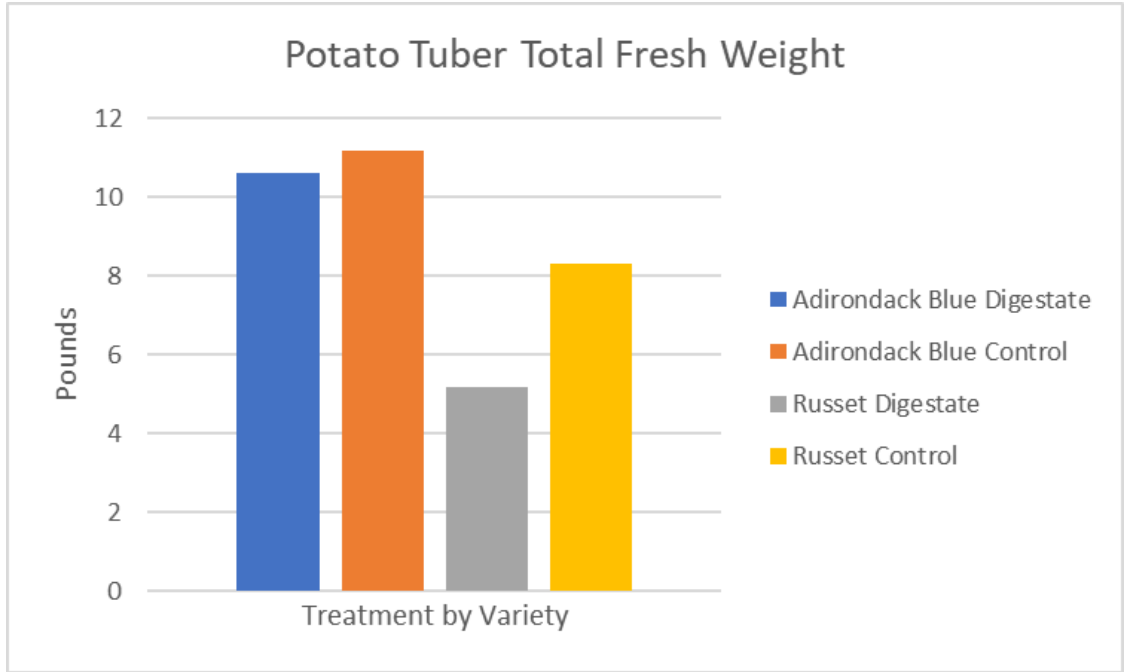


Fig. 2. Total potato tuber fresh weight of two varieties harvested from a 2m<sup>2</sup> subsample. Digestate = fertigated with ~ 4 gallons digestate + water every irrigation event (approximately twice weekly). Control = water only and run through an identical injector system to ensure equal irrigation volumes.

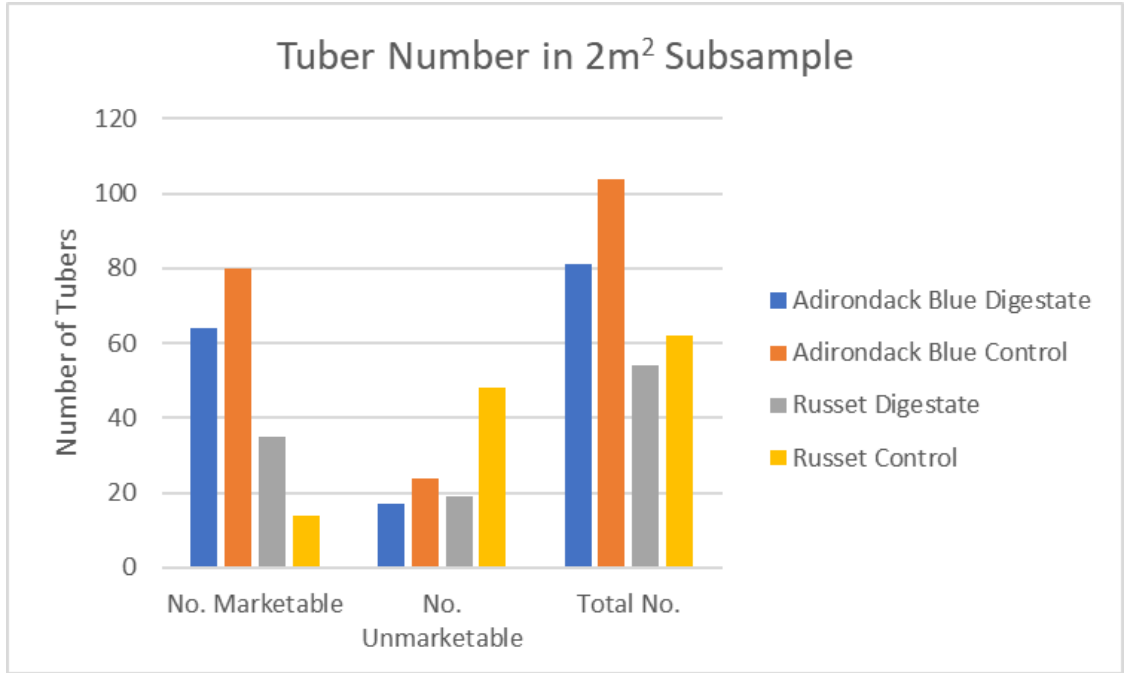


Fig. 3. Total potato tuber numbers and respective marketability of two varieties harvested from a 2m<sup>2</sup> subsample. Digestate = fertigated with ~ 4 gallons digestate + water every irrigation event (approximately twice weekly). Control = water only and run through an identical injector system to ensure equal irrigation volumes.

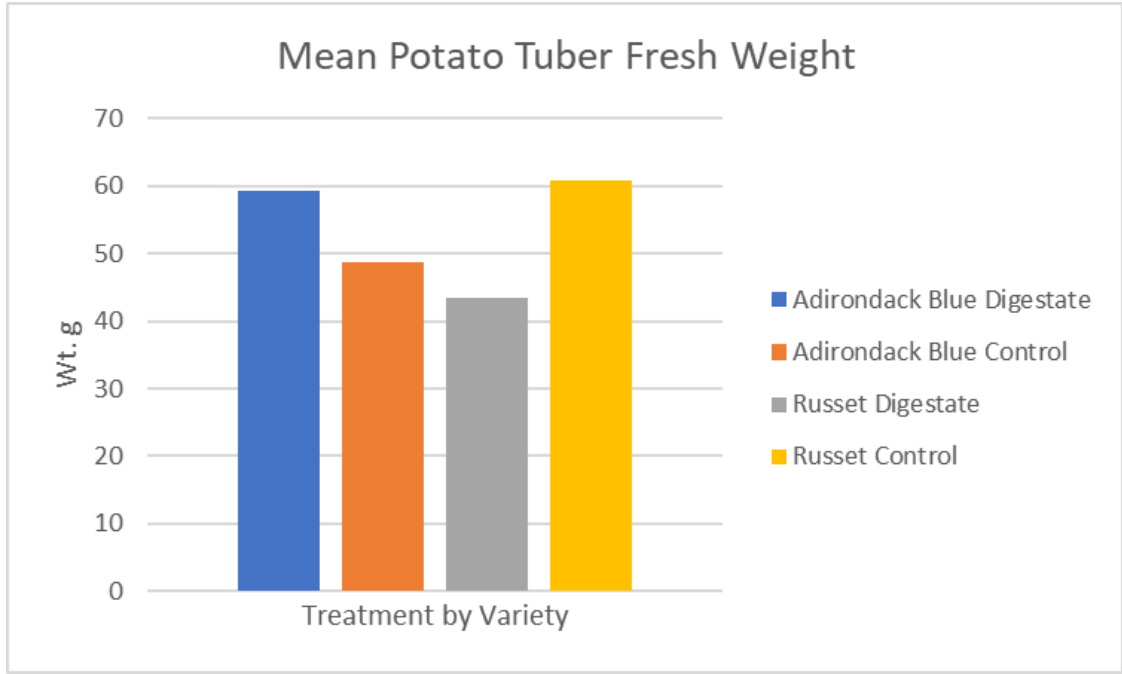


Fig. 4. Mean potato tuber fresh weight of two varieties harvested from a 2m<sup>2</sup> subsample. Digestate = fertigated with ~ 4 gallons digestate + water every irrigation event (approximately twice weekly). Control = water only and run through an identical injector system to ensure equal irrigation volumes.

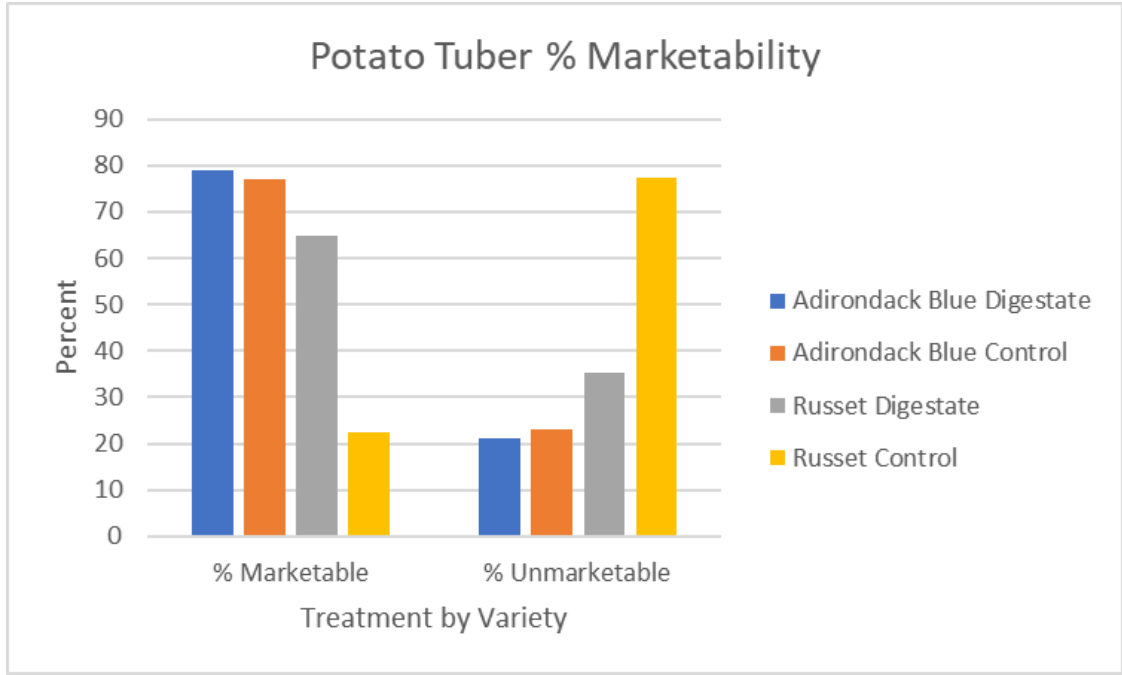


Fig. 5. Percent potato marketability of two varieties harvested from a 2m<sup>2</sup> subsample. Digestate = fertigated with ~ 4 gallons digestate + water every irrigation event (approximately twice weekly). Control = water only and run through an identical injector system to ensure equal irrigation volumes.



Fig. 6. Typical examples of potato tubers var. *Russet* harvested 2, September 2022. Marketable tubers (upper) were fertigated with digestate while unmarketable tubers (lower) were irrigated with water only. Treatments included: Digestate = fertigated with ~ 4 gallons digestate + water every irrigation event (approximately twice weekly). Control = water only and run through an identical injector system to ensure equal irrigation volumes. Potatoes were harvested from a 2m<sup>2</sup> subsample from two adjacent 100' raised beds. Digestate fertigated potatoes had a 65 percent marketability rate while those in the control group had a marketability rate of 23 percent (see Fig. 5). Damage to the skin of the control potatoes is typical of tuber flea beetle (*Epitrix tuberis*) larval feeding. Some minor adult flea beetle foliar feeding damage (shot holes) was observed during the growing season but was not compared between treatments. Overwintering adults lay eggs at the plant stem, larvae feed on tuber surfaces, beetles can produce up to three generations during one growing season.

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