Rob Read's No-Till Potato Variety Trials

by Sarah Larsen

Rob Read, Julie Walter and their three children live near Dutton, Ontario, on 50 acres of land they call Willow Creek Permaculture Farm. Here, they farm and run a learning pod/homeschooling enrichment program for children aged 6-12 and several day camps in the summer. On the land, Rob and Julie rotationally graze cattle and kunekune pigs, and raise turkey and chickens. They also grow fruit and nut trees, perennial vegetables and herbs, and tend large annual vegetable gardens for home sustenance, research, and breeding.

For the past several years, Rob has planted potatoes using the deep mulch method that was originally advocated by Ruth Stout in the 1950s.

"For those unfamiliar with Stout, she was a garden writer who wrote several books that are well worth your time," encourages Rob. "She advocated growing almost all crops with very heavy mulches of spoiled hay." Rob has had success with this system, with the addition of tarping on top of the mulch over winter. Of course, this is not the ideal method for all crops, especially those requiring warmer soil or requiring a fine tilth.

Potatoes are one of the crops most suited for the mulch method. "To plant" says Rob, "push any previous mulch aside, and plant seed potatoes on the surface of the soil. Then apply mulch to a depth of 1-2 feet". He notes that "as the mulch settles throughout the season, additions of more mulch are sometimes necessary". At harvest, simply push the mulch aside and harvest potatoes without any digging.

A system that requires so little effort without soil disturbance seems like a miracle, but as Rob points out "deep mulch methods tend to produce lower yields compared to hilling and digging" — highlighting a tradeoff of this simple method.

Even with this tradeoff, deep mulch is Rob's preferred way of growing potatoes, and he was curious about how different varieties performed with the method. With the help of EFAO's Farmer-Led Research Program, Rob designed a research trial to test 28 varieties of potatoes in three replicate blocks using 12-24" of spoiled hay mulch. Throughout the season, he weeded as needed, which was minimal.

In the fall, Rob harvested all replicates of the 28 varieties separately, and weighed them to obtain a total weight and marketable weight for each variety. For marketable weight, he excluded potatoes that had greening (especially where chickens had disturbed the mulch!), vole damage, or large growth cracks. In all, Rob took 84 (28 varieties x 3 blocks) measurements for total weight and 84 measurements for marketable weight.

"Once the data was in, we could see that there was a lot of variability among replicates", says Rob. "For example, Amarose had relatively high yields in two replicates (887 and 839 g/plant), and a relatively low yield (303 g/plant) in the third replicate," he explains. This type of variability made it hard to discern differences among varieties with statistical confidence.

"Due to the variability, there was only one variety that I could reliably call "top yielding," a handful that were consistently low yielding, and the majority in the middle," he notes. Rob found that Chieftain was the top yielding variety across all three replicates, whereas Huckleberry Gold, Yukon Gold, Kennebec, Sangre, Purple Viking, and Dakota Pearl offered the lowest yields. The others were somewhere in between high and low, but without the statistical confidence to rank them beyond that.

Layering in-field observations with the statistical tests, Rob ranked the potato varieties, as shown in **Table 1.**

Table 1. Yield and marketable yield of the 28 potato varieties Rob tested in this trial, listed in order of average marketable yield per plant. Note that Rob placed some edible (and sellable) potatoes in the unmarketable category, such as those with growth cracks that typically come from fast growth due to heavy rains.

VARIETY	TYPE	AVERAGE TOTAL YIELD (G/PLANT)	AVERAGE MARKETABLE YIELD (G/ PLANT)	YIELD NOTES
CHIEFTAIN	Red/White	1,113	908	Overall Best Yield; Best Red/White
RUSSIAN BLUE	Blue/Blue	1,001	815	Highest Yield, Blue/Blue
BELLANITA	Yellow/Yellow/ (Fingerling)	968	751	Highest Yield, Yellow/Yellow
PURPLE MAJESTY	Blue/Blue	875	730	Second Highest Yield, Blue/Blue
BRIDGET	Yellow/White	1,026	670	Highest Yield, Yellow/White
ORCHARD HILL ROSE	Red/White	643	595	Runner-up, Red/White
AMAROSA	Red/Red	676	589	Highest Yield, Red/Red
AGRIA	Yellow/Yellow	804	574	Second Highest Yield, Yellow/Yellow
GREEN MOUNTAIN	Tan/White	611	547	Highest Yield, Tan/White
NORLAND	Red/White	655	519	Runner-up, Red/White
SUPERIOR	Yellow/White	550	491	Runner-up, Yellow/White
OLD FASHION RED'	Red/White	570	470	Runner-up, Red/White
BALLERINA	Yellow/Yellow	457	448	Runner-up, Yellow/Yellow
CARIBE	Light Purple/ White	660	441	Highest Yield, Light Purple/White
FRENCH FINGERLING	Fingerling; Red/ Cream	704	438	Runner-up, Fingerling
ROKO	Red/White	587	411	Runner-up, Red/White
PINK FIR APPLE	Fingerling; Pink/ Yellow	470	396	Runner-up, Fingerling
RUSSET	Russet; Brown/ White	442	388	
ALTA ROSE	Red/Cream with pink	402	373	
GOLD RUSH	Russet; Light Brown/White	561	358	
NICOLA	Yellow/Yellow	567	324	Runner up, Yellow/Yellow
EXCELLENCY	Yellow/Pale Yellow	504	314	
HUCKLEBERRY GOLD	Purple/Yellow	349	298	Lowest Yield
YUKON GOLD	Yellow/Yellow	453	290	Lowest Yield
KENNEBEC	Yellow/White	473	254	Lowest Yield
SANGRE	Red/White	351	195	Lowest Yield
PURPLE VIKING	Mottled purple and red/White	242	194	Lowest Yield
DAKOTA PEARL	Pale yellow/ White	269	145	Lowest Yield

Rob selected his favourites largely based on overall yields, but not exclusively. "Because we grow mostly for our family, overall yields were more important to us than marketable yields because potatoes with growth cracks are completely fine to eat—and we didn't see a lot of greening", he says.

Chieftain, the top performing variety in this trial.

Pink Fir Apple. Beautiful, but very fiddly to clean.

A row unmulched and ready to weigh.

"We also want to grow a variety of colours in the future, so we selected favourites based on the ones that did best in each colour group," he continues.

Finally, Rob included Nicola because he observed that it was actually higher yielding than recorded, but was probably miscounted because it was grown beside a very similar looking potato. For this reason, he wants to reassess it in future years.

A heap of French Fingerling.

Bellenita waiting to be weighed.

"When growing potatoes for market this way," stresses Rob, "protection from voles is paramount. In order of perceived importance, the methods we employed for vole deterrence were a device called a sonic spike, which is marketed to get rid of moles and available in local hardware stores; cats to hunt the voles; and planting various alliums such as onions and garlic around potato plantings, which are said to dissuade voles from crossing them."

The 'kingdom' of Purple Majesty.

Potato piles ready to weigh.

"Of course, greening is another issue to watch with mulch methods, especially in lighter-skinned varieties," says Rob. "It seemed less pronounced in red-skinned varieties, and hardly noticed at all on blue/purple-skinned varieties," he noted.

Maintaining a steady level of mulch all season can help with preventing greening, as can isolating the plantings from free-range poultry that have a tendency to toss the mulch around.

After this study, Rob is still a big fan of the no-till method for potatoes—even with the potential for lower yields. He encourages other growers to try the method if it makes sense for their operation. "If you don't have access to traditional potato harvesting equipment, the labour savings with the deep mulch method alone can be huge," he encourages. And he adds, "to make up for lower yields, multi-coloured potatoes could be packaged together as 'rainbow potatoes,' especially to customers who are interested in nutrient-dense food!"

You can read Rob's full report in the EFAO Research Library. ■

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