

Organic Systems Vegetable Trial 2007 Plot Treatments and Yields

Entry Point 1: Main crop was early potatoes

Potatoes were planted by hand after marking rows at 30" apart with two small "furrower" shovels mounted on a toolbar. They were cut by hand and placed 9-10" apart. They were then covered with hilling discs mounted on an Allis Chalmers G tractor. Potato rows were furrowed, planted, and covered from 5/8-5/11. Potatoes emerged slowly due to cool, dry weather. First cultivation was 6/6, second 6/11. The potatoes were irrigated once on 6/12. They were sprayed for Colorado potato beetles on 6/21 with a mixture of Surround (15 lb/A) and Entrust (2 oz/ A), which worked well. Potatoes were hilled on 6/26. On 7/3, potatoes were sprayed with Surround (15 lb/A) + Entrust (2 oz/ A)+ Pyganic (1 pt/A) for CPB and potato leafhopper. A heavy rain suppressed PLH after this, until a last spray was applied on 7/25 with a mixture of Pyganic (1 pt/A) + Champion fixed copper (2#/A) to control PLH and foliar diseases. The plants began to die down about a week later. They were mowed off on 8/13 and data harvest was on 8/14. Potatoes were harvested with a two-row digger and removed from the field by 8/17.

1.1 System 1 (early potatoes followed by rye)

Potato	Total Yield (lb/acre)	Marketable Yield (lb/acre)
Yukon Gold	26,000	18,100
Spring cover crop	(dry lb/acre)	
Rye	411	
Fall cover crop	(dry lb/acre)	
Rye	2382	

There was a rye cover crop on the plots over winter, planted late the previous fall. This was moldboard plowed on 5/3. Fessenden compost was spread at 11.6 tons/acre (fresh weight) on 5/8, then disced in. The rest of the potato management was as above. Plots were springtooth harrowed on 8/30, then drilled to rye @120 lb/A. This made a good stand by fall.

1.2 System 2 (early potatoes followed by wheat and hairy vetch)

Potato	Total Yield (lb/acre)	Marketable Yield (lb/acre)
Yukon Gold	20,500	14,400
Spring cover crop	(dry lb/acre)	
Rye	475	
Fall cover crop	(dry lb/acre)	
Fredrick wheat	1759	
Hairy vetch	487	

There was a late-planted rye cover crop over winter before planting potatoes (the intended field pea/soybean cover crop was disced under in the fall due to chickweed pressure). This was moldboard plowed on 5/3. Fessenden compost was spread at 5.8 tons/acre on 5/8, then disced in. The rest of the potato management was as above. Plots were springtooth harrowed on 8/31, then drilled to Fredrick wheat @92 lb/A and hairy vetch @ 40 lb/acre. This made a good stand by fall.

1.3 System 3 (cover crops and fallow)

Spring cover crop	(dry lb/acre)
Rye	4000 est.
Summer/Fall cover crop	
Buckwheat	2000 est.
Red clover	1694

These plots were in rye, planted late the previous fall after a rye/hairy vetch mixture had been disced under due to too much chickweed. The rye was flail mowed on 5/25 and 6/18, then moldboard plowed on 6/26. It was springtooth harrowed on 7/9 and 7/25. Buckwheat was broadcast @ 100 lb/A with a hand-spinner on 7/26 and rolled in with a cultimulcher used with its tines up. Inoculated red clover was broadcast @ 40 lb/A the same day. These grew well. The buckwheat was flail mowed on 9/4, and the clover allowed to grow. 5.8 tons/acre of compost was spread on 10/9. The clover put on good growth by late fall.

1.4 System 4 (ridge till potato, then oats and hairy vetch)

Potato	Total Yield (lb/acre)	Marketable Yield (lb/acre)
Yukon Gold	21,200	10,600
Fall cover crop	(dry lb/acre)	
Esker oats	2307	
Hairy vetch	259	

A layer of dead field peas and soybeans covered the ridged plots all winter. These were scraped off the ridges on 5/4 and 5.8 tons/A of compost was spread on 5/8. The rest of the potato management was as above. The ridges were destroyed during harvest, but remade on 8/31 in the same locations by ridging up with a potato hiller, after drilling Esker oats @ 104 lb/A and hairy vetch @ 40 lb/A. These cover crops grew well, with some chickweed (about 50 lb/A dry weight).

Entry Point 2: Main crop was early lettuce

Ermosa and New Red Fire lettuce varieties were seeded in an organically-managed greenhouse on 4/16-19. New Red Fire was replanted on 4/27 because of poor germination. Plants were brought out to Freeville and put into a cold frame from 5/10-5/17 until transplanting. They were drenched with Phytamin 801 before transplanting began on 5/29 to perk them up. The plots were irrigated once on 6/12. The first and only cultivation was on 6/18. Harvest dates were 7/5, 7/10, and 7/16. Lettuce was removed from the plots on 7/18-20. Plots were rotary mowed on 7/23 and systems 1-3 were moldboard plowed the same day. System 4 plots were hilled on 7/25, and systems 1-3 were disced. Cover crops were handled differently for each system.

2.1 System 1 (early lettuce followed by spinach)

Lettuce	Total Yield (heads/acre)	Percent Marketable
Ermosa	10283	56.7
New Red Fire	6499	36.1
Spinach	(lb/acre)	
Melody	3978	80.0
Fall cover crop	(dry lb/acre)	
Rye	0 est.	

Dead cabbage stumps chickweed covered the plots over winter. These were moldboard plowed on 5/25 after the application of 6 tons/acre of compost. They were disced on 5/31, and lettuce transplanting began that day and was completed on 6/6. The crop was grown and harvested as above. Plots were rotovated on 8/2 and Melody spinach (untreated seed) seeded @ 70 seeds/ft, 15" between rows, in 3 row beds on 5' centers. The stand was poor, probably due to excessive temperatures. The spinach was cultivated on 8/17 and 8/29. Tall weeds were mowed off above the spinach plants with a rotary mower on 9/14. Data harvest was 10/5 and the crop was removed from the field on 10/10. Plots were springtooth harrowed on 10/17 and 10/31, and seeded with rye on 10/31 with a hand seeder @ 120 lb/acre. The seed was rolled in with a cultmulcher with the tines lifted.

2.2 System 2 (early lettuce followed by buckwheat/red clover)

Lettuce	Total Yield (heads/acre)	Percent Marketable
Ermosa	9991	56.3
New Red Fire	11176	62.6
Fall cover crop	(dry lb/acre)	
Buckwheat	2000 est.	-
Red clover	1703	-

Dead cabbage and bell bean stumps and chickweed covered the plots over winter. These were moldboard plowed on 5/25 after the application of 3 tons/acre of compost. They were disced on 5/31, and lettuce transplanting began that day and was completed on 6/6. The crop was grown and harvested as above. Plots were disced on 7/25, then seeded with a hand spinner to buckwheat @ 100 lb/acre and red clover @ 40 lb/acre on 7/26. The seed was rolled in with a cultimulcher with the tines lifted. The buckwheat was flail mowed on 9/4, and the clover allowed to grow. It put on good growth by late fall.

2.3 System 3 (early lettuce followed by buckwheat, fallow, and rye)

Lettuce	Total Yield (heads/acre)	Percent Marketable
Ermosa	14255	79.7
New Red Fire	10579	56.2
Spring cover crop	(dry lb/acre)	
Rye	3000 est.	
Fall cover crop	(dry lb/acre)	
Buckwheat	2000 est.	-
Rye	0 est.	-

Rye covered the plots over winter. This was moldboard plowed on 5/25 after mowing the rye with a rotary mower. Plots were disced on 5/31, and lettuce transplanting began that day and was completed on 6/6. The crop was grown and harvested as above. Plots were disced on 7/25, then seeded with a hand spinner to buckwheat @ 100 lb/acre on 7/26. The seed was rolled in with a cultimulcher with the tines lifted. The buckwheat was flail mowed on 9/4, and disced on 9/26. Plots were springtooth harrowed on 10/17 and 10/31, and seeded with rye on 10/31 with a hand seeder @ 120 lb/acre. The seed was rolled in with a cultimulcher with the tines lifted.

2.4 System 4 (ridge till early lettuce followed by oats and peas)

Lettuce	Total Yield (heads/acre)	Percent Marketable
Ermosa	14772	80.3
New Red Fire	10201	50.0
Fall cover crop	(dry lb/acre)	
Esker oats	4184	-
Peas	206	-

Dead cabbage and bell bean stumps and chickweed covered the plots over winter. The plots were flamed with a tractor-mounted flamer on 5/3, then re-ridged with a potato hiller on about 5/7. The ridges were scraped on 5/29 after the application of 3 tons/acre of compost. Lettuce was transplanted from 5/29-5/31. The crop was grown and harvested as above. Ridges were scraped on 8/13. On 8/20, Esker oats were drilled @ 104 lb/acre followed by grain-type field peas @ 149 lb/acre, then plots were hilled with a potato hiller.

EP 1

System	Yukon Gold potato (total lb per acre)	Yukon Gold potato (marketable lb per acre)	Legume cover crop (dry lb per acre)	Non-legume cover crop (dry lb per acre)
1	26,000	18,100	-	2382
2	20,500	14,400	487	1759
3	-	-	1694	6000 est.
4	21,200	10,600	259	2307

EP 2

System	Ermosa lettuce, (marketable heads per acre)	New Red Fire lettuce, (marketable heads per acre)	Melody spinach, (marketable lb per acre)	Legume cover crop (dry lb per acre)	Non-legume cover crop (dry lb per acre)
1	10,283	6,499	3978	-	0 est.
2	9,991	11,176	-	1703	2000 est.
3	14,255	10,579	-	-	5000 est.
4	14,772	10,201	-	206	4184