

## Organic Systems Vegetable Trial 2010 Plot Treatments and Yields

### *Entry Point 1: Main crop was early lettuce*

Optima and New Red Fire lettuce varieties were seeded in an organically-managed greenhouse on 4/21-22. Conditions were warm and the plants elongated, resulting in reduced quality at harvest. Plants were brought out to Freeville and put into a cold frame from 5/21 until transplanting on 5/25-28. The plots were irrigated once on 5/28-6/1. Plants were cultivated on 6/8 and hand hoed on 6/11. Harvest dates were 6/29 and 7/6. Lettuce was removed from the plots on 7/8-16. Plots were rotary mowed on that day. Systems 1-3 were moldboard plowed on 7/21. System 4 plots were chisel plowed (in valleys), mowed and re-ridged, and systems 1-3 were disced on 7/28. Subsequent plantings were handled differently for each system.

#### **1.1 System 1 (early lettuce followed by spinach)**

<b>Lettuce</b>	<b>Marketable Yield (heads/acre)</b>	<b>Percent Marketable</b>
Optima	20328	
New Red Fire	9438	
<b>Spinach</b>	<b>(lb/acre)</b>	
Renegade	11,442	

Dead cabbage stumps and chickweed covered the plots over winter. These were moldboard plowed on 4/29. 5.3 tons/acre of Cornell Farm Services compost (0.6-0.4-0.67) was applied on 5/24. They were harrowed on 5/24, and lettuce was transplanted from 5/25-28. The crop was grown and harvested as above. Krehers chicken compost (3.4-4.6-2.6) was spread at 536 #/acre on 8/3 and harrowed in. Organic Renegade spinach seeded @ 14 seeds/ft, 15" between rows, in 3 row beds on 5' centers. The stand was fair but growth was very good. The spinach was cultivated on 8/19 and hand hoed on 8/30-31. Data harvest was 10/7 and the crop was removed from the field on about 10/10.

#### **1.2 System 2 (early lettuce followed by buckwheat/red clover)**

<b>Lettuce</b>	<b>Marketable Yield (heads/acre)</b>	<b>Percent Marketable</b>
Optima	10648	
New Red Fire	4114	
<b>Fall cover crop</b>	<b>(dry lb/acre)</b>	
Buckwheat	2963	-
Red clover	75	-

Dead cabbage and bell bean stumps and chickweed covered the plots over winter. These were moldboard plowed on 4/29. 2.65 tons/acre of Cornell Farm Services compost (0.6-0.4-0.67) was

applied on 5/24. Plots were harrowed on 5/24, and lettuce was transplanted from 5/25-28. The crop was grown and harvested as above. Plots were seeded with a hand spinner to buckwheat @100 lb/acre and red and crimson clover @ 10 lb/acre each on 7/29. The seed was rolled in with a cultimulcher with the tines lifted. The buckwheat was flail mowed on 9/10, and the clover allowed to grow.

### **1.3 System 3 (early lettuce followed by buckwheat, fallow, and rye)**

<b>Lettuce</b>	<b>Marketable Yield (heads/acre)</b>	<b>Percent Marketable</b>
Optima	17182	
New Red Fire	7744	
<b>Spring cover crop</b>	<b>(dry lb/acre)</b>	
Rye	-	
<b>Fall cover crop</b>	<b>(dry lb/acre)</b>	
Buckwheat	2802	-
Rye	-	-

Rye covered the plots over winter. This was rotovated on 4/15. Plots were harrowed on 5/4 and 5/24. 2.65 tons/acre of Cornell Farm Services compost (0.6-0.4-0.67) was applied on 5/24. The crop was grown and harvested as above. Plots were disced on 7/28, then seeded with a hand spinner to buckwheat @100 lb/acre on 7/29. The seed was rolled in with a cultimulcher with the tines lifted. The buckwheat was flail mowed on 9/10, and disced on 10/18. Plots were springtooth harrowed on 11/9, and seeded with rye that day with a hand seeder @ 200 lb/acre. The seed was rolled in with a cultimulcher with the tines lifted.

### **1.4 System 4 (ridge till early lettuce followed by oats and peas)**

<b>Lettuce</b>	<b>Marketable Yield (heads/acre)</b>	<b>Percent Marketable</b>
Optima	7260	
New Red Fire	726	
<b>Fall cover crop</b>	<b>(dry lb/acre)</b>	
Esker oats	1725	-
Peas	1443	-

Dead cabbage and bell bean stumps and chickweed covered the plots over winter. The plot valleys were cultivated, then plots were re-ridged with a potato hiller on 5/4. The ridges were scraped on 5/24 before the application of 2.65 tons/acre of CFS compost. Kreher's chicken manure compost was sidedressed into the ridges @ 375#/acre the same day. The crop was grown and harvested as above. Plots were mowed and re-ridged on 7/28, after running through the valleys with a chisel plow to loosen the soil. Ridges were scraped on 8/16. On 8/17, Esker oats were drilled @75 lb/acre followed by a mix of Magnum and 4010 field peas @ 150 lb/acre, then plots were re-ridged with a potato hiller.

## ***Entry Point 2: Main crop was fall cabbage***

Cabbage transplants were grown in an organically-managed plastic greenhouse at Cornell. They were seeded on June 14 into McEnroe light potting soil mix in #72 flats. No fertilizer was applied. Plants were hardened off starting July 5. The variety grown was Farao. Cabbage was transplanted 7/14-15. All plots were irrigated on 7/19 and 8/20. Plots were cultivated on 7/30, 8/13, and 8/18, and also hand hoed on Aug. 3-4 with stirrup hoes. Entrust and Surround were applied to cabbage to control flea beetles on 7/30. Bt was sprayed on 8/27 and 9/29 vs. caterpillars. Cabbage yield data was collected on Oct. 26. Crop was fully removed by November 11. Cabbage stumps and V3 oats and peas were rotary mowed on 11/15.

### **2.1. System 1 (peas followed by late cabbage)**

<b>Peas</b>	<b>Marketable lb per acre</b>
Sugar Sprint	4703
<b>Cabbage</b>	
Farao	46,711

These plots were bare over winter, untilled after removal of plastic mulch in fall 2009. They were field cultivated on April 13 and 20. They were then roller-harrowed on 4/20 and seeded with inoculated Sugar Sprint peas on April 21 with a Great Plains no-till grain drill (@ 3 rows x14" per bed, the other holes taped over). The peas were cultivated with beet knives on May 5 and June 3. Plots were irrigated on 5/28 and 6/1 (half dose each time). Data harvest was on 6/23, 6/28 and 7/1. An amount of peavines proportionate to the percentage of harvestable peas was removed from the plots by 7/1. Plots were flail mowed on 7/8. After an application of 8.83 tons/acre of Cornell Farm Services compost (0.6-0.4-0.67) on 7/12, plots were disced the same day and cultipacked on July 13.

### **2.2 System 2 (oats and peas, then late cabbage)**

<b>Cabbage</b>	<b>Marketable lb per acre</b>
Farao	44,340
<b>Spring Cover Crop</b>	<b>(lb/acre)</b>
Oats	2517
Peas	5158

Plots were bare over winter after squash harvest. They were tilled with a field cultivator on 4/13. They were planted to organic Esker oats (82.4#/A) and inoculated 4010 forage peas (132#/A) the next day. These grew strongly, producing 5158 lb/acre (containing 159 lb/acre N) and 2517 lb/acre, respectively, before they were flail mowed on 7/8. After application of 2.65 tons per acre of Cornell Farm Services compost, plots were disced on 7/12 and cultipacked on 7/13.

### **2.3. System 3 (rye, fallow, soybeans, oats + peas)**

<b>Spring Cover Crop</b>	<b>(lb/acre)</b>
Rye	3768
<b>Fall Cover Crop</b>	
Oats	1492
Peas	1849

These plots had rye over the winter. They were flail mowed on 6/9, rotovated on 6/18, then disced on 7/8. The plots were harrowed on 7/13, 8/2 and 8/16, then drilled to Keuka oats (75#/A) and a mixture of 4010 and Maxum peas (150#/A).

### **2.4 System 4 (oats and peas, then late cabbage on ridges)**

<b>Cabbage</b>	<b>Marketable lb per acre</b>
Farao	30,043
<b>Spring Cover Crop</b>	<b>(lb/acre)</b>
Oats	1214
Peas	5533

Plots were bare over winter after squash harvest. They were scraped and cultivated in preparation for re-ridging on 4/13. The next day, they were drilled with organic Esker oats (82.4#/A) and inoculated 4010 forage peas (132#/A), then re-ridged. The cover crops grew strongly, producing 5533 lb/acre (containing 151 lb/acre N) and 1214 lb/acre, respectively, before they were flail mowed on 7/8. They received a double scraping on 7/12. Cornell farm services compost @ 2.65 tons/acre was applied to the scraped surface the same day.

**2010 Organic Cropping System Project Marketable Vegetable Yields, EP 1**

<b>System</b>	<b>Optima lettuce, (marketable heads per acre)</b>	<b>New Red Fire lettuce, (marketable heads per acre)</b>	<b>Melody spinach, (marketable lb per acre)</b>	<b>Fall legume cover crop (dry lb per acre)</b>	<b>Fall non-legume cover crop (dry lb per acre)</b>
1	20,328	9,438	11,442	-	-
2	10,648	4,114	--	75	2963
3	17,182	7,744	-	-	2802
4	7,260	726	-	1443	1725

**Entry Point 2**

<b>System</b>	<b>Farao Cabbage Pounds per acre</b>	<b>Sugar Sprint Peas Pounds per acre</b>	<b>Spring legume cover crop (dry lb per acre)</b>	<b>Spring non-legume cover crop (dry lb per acre)</b>	<b>Fall legume cover crop (dry lb per acre)</b>	<b>Fall non-legume cover crop (dry lb per acre)</b>
1	46,711	4703	(4519 pea residue)	-		
2	44,340	-	5158	2517		
3	-	-		3768	1849	1492
4	30,043	-	5533	1214		