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## Grain Project, 2010-15

As a biodynamic farm, S&S Homestead is committed to the goal of self-sufficiency, including self-renewing soil fertility. The project tests a rotational schedule on three 1-acre fields, alternating harvestable grain crops with legumes (including beans) and other green crops to increase soil organic matter and nitrogen.

### **Five-Year Grain, Bean and Cover Crop Rotation**

#### ***Field 1 (1 acre) South Field***

2010

Spring-Summer	Plant buckwheat (May)
Fall-Winter	Graze (sheep), mow, rototill buckwheat (July-August) Plant winter rye (September-October)

2011

Spring-Summer	Harvest rye (August)
Fall-Winter	Plant cover crop (September-October)

2012

Spring-Summer	Graze, mow, rototill cover crop (April) Plant beans (May) Harvest beans (August)
Fall-Winter	Plant winter wheat (September-October)

2013

Spring-Summer	Harvest winter wheat (August)
Fall-Winter	Plant cover crop (September-October)

2014

Spring-Summer	Graze, mow, rototill cover crop (April) Plant barley (May)
Fall-Winter	Harvest barley (August-September) Plant rye (September-October)

2015

Spring-Summer	Graze, mow, rototill rye (April) Plant spring wheat (May)
Fall-Winter	Harvest spring wheat (August) Plant cover crop (September-October)

#### ***Field 2 (1 acre) North Field***

2010

Spring-Summer	Plant barley (May)
Fall-Winter	Mow and rototill barley (infested with mustard) (September) Plant rye (September)

2011	
Spring-Summer	Graze, mow, rototill rye (April-May) Plant barley (May)
Fall-Winter	Harvest barley (August-September) Plant cover crop (September-October)
2012	
Spring-Summer	Graze, mow, rototill cover crop (April-May) Plant winter wheat (May)
Fall-Winter	Harvest winter wheat (August-September) Plant cover crop (September-October)
2013	
Spring-Summer	Graze, mow, rototill cover crop (April-May) Plant oats (May)
Fall-Winter	Harvest oats (August-September) Plant rye (September-October)
2014	
Spring-Summer	Graze, mow, rototill rye (April-May) Plant beans (May)
Fall-Winter	Harvest beans (August) Plant rye (September-October)
2015	
Spring-Summer	Harvest rye (August)
Fall-Winter	Plant cover crop (September-October)

***Field 3 (1 acre) North Field***

2010	
Spring-Summer	Plant barley (May)
Fall-Winter	Mow, rototill barley (infested with mustard) Plant rye (September)
2011	
Spring-Summer	Graze, mow, rototill rye (April-May) Plant oats (May)
Fall-Winter	Harvest oats (August-September) Plant cover crop (September-October)
2012	
Spring-Summer	Graze, mow, rototill cover crop (April-May) Plant spring wheat (May)
Fall-Winter	Harvest spring wheat (August-September) Plant cover crop (September-October)

2013  
 Spring-Summer Graze, mow, rototill cover crop (April-May)  
 Plant beans (May)  
 Fall-Winter Harvest beans (August)  
 Plant winter wheat (September-October)

2014  
 Spring-Summer Harvest winter wheat (August)  
 Fall-Winter Plant cover crop (September-October)

2015  
 Spring-Summer Graze, mow, rototill cover crop (April-May)  
 Plant barley (May)  
 Fall-Winter Harvest barley (August-September)  
 Plant cover crop (September-October)

***Projected Harvests (quantities undetermined)***

	Rye	Barley	Oats	Spring Wheat	Winter Wheat	Beans
2011	1	1	1			
2012				1	1	1
2013			1		1	1
2014		1			1	1
2015	1	1		1		
5-year totals	<u>2</u>	<u>3</u>	<u>2</u>	<u>2</u>	<u>3</u>	<u>3</u>

***Required infrastructure and inputs***

3 acres, deer-fenced (S&S)  
 Soil preparation – tractor, rototiller (S&S)  
 -- spraying rig for BD preparations (S&S)  
 -- BD preparations (BD500 Spring-Fall) (S&S)  
 Planting – manual or by tractor-operated seeder (S&S)  
 Harvest – binder (Curry-Lillestol)  
 thresher (Curry-Lillestol)  
 cleaner (?)  
 storage: five 2-ton bins (S&S)

***Current grain trials (S&S)***

I. 2008-2010  
 Winter wheat (seed supplied by Steven Jones, WSU, Mt. Vernon)  
 2 annual plantings 60 g > 2 kg > 25 kg (estimate), rust resistant

II. 2010-11

Oats, barley, wheat (seed supplied by Steven Jones and OJ)

4 foot plots, 60 g seed per plot, planted September 21, 2010

Initial bird predation, on second day covered with remay

	Date:	Observations:
1. Monida Spring Oats	11/14 (7 weeks)	Vigorous, 15"
2. Park Spring Oats	Dto.	Vigorous, 14"
3. Bear Spring Barley	Dto.	No germination
4. Charles Winter Barley	Dto.	Very thick, 13"
5. Darwin Hard Winter Hard Wheat	Dto.	Thick, 8-9"
6. Juniper Hard Winter Wheat	Dto.	Thick, 9"
7. Neeley Hard Winter Red Wheat	Dto.	Thick, 5-6"
8. Lambert Soft Winter Wheat	Dto.	Vigorous, 9-10"
9. Edwin Soft Winter White Wheat	Dto.	Thick, 8-9"
10. Gene Soft Winter Wheat	Dto.	Vigorous, 10"
11. Cashup Soft Winter Wheat	Dto.	Thick, 8"
12. Louise Soft Spring Wheat	Dto.	Thick, 10"
13. Kyle Spring Durham Wheat	Dto.	Thick, 13"
14. Boundary Hard Winter Red Wheat	Dto.	Vigorous, 5-6"

III. 2010-11

Six rye varieties (seed supplied by Jeffrey Endelman, WSU, Mt. Vernon)

5x15 foot randomized plots, 130g seed=170lbs/acre, 3 replications, planted October 12, 2010.

No remay; no observed bird predation, but extensive rabbit damage

1. Rymin	Minnesota Crop Improvement Association	Grain variety, released 1973
2. Hancock	Wisconsin Crop Improvement Association	Grain variety, released 1979
3. Elbon	Oklahoma Foundation Seed Stocks	Forage variety, released 1967
4. Maton	Oklahoma Foundation Seed Stocks	Forage variety, released 1976
5. Wrens Abruzzi	Georgia Seed Development Commission	Forage/grain variety, released 1953
6. not stated	Wilbur Ellis, Burlington, WA	seed from Canada

MDM

Map:

	Date:	Observations:
5 Wrens Abruzzi	9/14	40% germ rabbit damage
4 Maton		40% germ dto.
6 Canada		10% germ dto.
1 Rymin		10% germ dto.
MDM		10% germ dto.
3 Elbon		10% germ dto.
2 Hancock		30% germ dto.
1 Rymin		30% germ dto.
MDM		20% germ dto.
5 Wrens Abruzzi		40% germ dto.

3 Elbon	40% germ	dto.
2 Hancock	20-30% germ	dto.
6 Canada	10% germ	dto.
4 Maton	50% germ	dto.
6 Canada	10% germ	dto.
5 Wrens Abruzzi	40% germ	dto.
4 Maton	30% germ	dto.
3 Elbon	20% germ	dto.
2 Hancock	min. germ.	?
1 Rymin	min. germ.	?

### ***Fertility***

As a biodynamic farm, S&S Homestead is committed to the goal of self-sufficiency, including self-renewing soil fertility, without bringing in inputs from outside the farm. The rotational schedule above alternates harvestable grain crops with legumes (including beans) and other green crops to increase soil organic matter and nitrogen. Grazing of green crops by sheep will predigest organic matter, adding beneficial bacteria and other microorganisms, as well as phosphorus (from urin). Residual green crops will be mowed as necessary before rototilling to a depth of no more than 3 inches.

Soil fertility will be assessed visually to evaluate soil water and air retention capacity. On-farm chemical tests will assess N, P, K, and soil organic matter (currently 12% in biodynamically treated vegetable garden, 8-9% in pastures).

The ultimate test of soil fertility will be whether average grain crop yields of ca. 3,000 lbs/acre can be achieved and sustained over time.

If necessary, small quantities of mineral fertilizers will be added each season to achieve baseline fertility levels to be maintained by on-farm inputs only.