Tamarack Farms Pea-Quinoa ("Peanoa") Intercrop

Project duration: May 2019 – August 2019
Objectives: To demonstrate the use of cover cropping strategies
Collaborators: Ryan Pengelly, Tamarack Farms

Results

Plots were combined and the pea and quinoa crops were separated and examined for yield. Average yields for each treatment are shown in Table 1. Total yields for each treatment are shown in Figure 1.

Table 1: Yields for Pea-Quinoa Treatments

	Pea	Quinoa	Pea
Avg by trt	lb/ac		bu/ac
Pea only	153.2	N/A	2.55
MP - MQ	103.0	501.9	1.72
HP - HQ	132.9	400.6	2.22
LP - LQ	80.7	508.3	1.35
HP - LQ	154.2	248.4	2.57
MP - HQ	97.0	557.6	1.62
Quinoa only	N/A	873.9	0.00
HP - MQ	153.3	538.9	2.55
LP - HQ	100.3	821.4	1.67
LP - MQ	63.3	490.5	1.06
MP - LQ	139.7	358.8	2.33

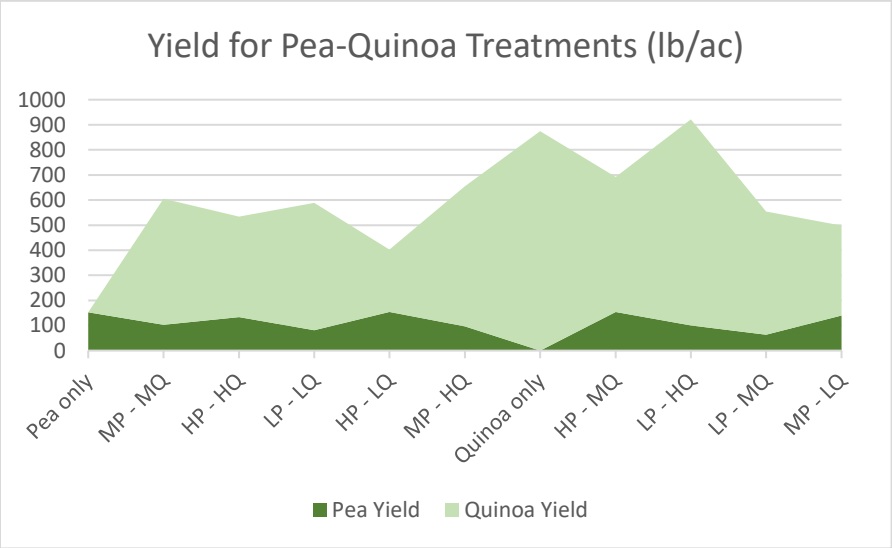

Figure 1: Yield for Pea-Quinoa Treatments

Although some treatments out-yielded others, no treatment yielded well. (Pea yields averaged 2 bu/ac, compared to 53-63 bu/ac as a regional average.) However, very dry conditions for about three weeks before and three weeks after seeding resulted in poor, delayed emergence, especially for peas. Delayed

emergence resulted in flowering for peas during higher temperatures, causing poor pod-set, reducing yield. Further, several flushes of weeds competed with the crops for moisture.

Background

The trial examines the effect of seeding rate on yield of a pea-quinoa intercrop, using high, medium and low rates for both crops. Proposed benefits of intercropping include: 1) confusion of insect populations; 2) beneficial nutrient interactions such as nitrogen fixation; 3) support for crops prone to lodging; 4) increased combined yields; 5) mitigation of the risk of crop failure; 6) weed suppression; and 7) reduced input requirements and costs.

Materials & Methods

Experimental Design:	Random Complete Block Design
Entries:	11
Seeding:	May 22
Harvest:	Sept 25
Agronomic info	
Previous year's crop:	Soy
Soil Type:	Erickson Loam Clay
Landscape:	Rolling with trees to the east
Seedbed preparation:	Heavy harrowed twice

Table 1: Treatments

Pea only	Low Pea – Low Quinoa	Quinoa only
High Pea-High Quinoa	High Pea-Low Quinoa	High Pea-Medium Quinoa
Medium Pea-Medium Quinoa	Medium Pea-High Quinoa	Low Pea-High Quinoa
Low Pea-Medium Quinoa	Medium Pea-Low Quinoa	

Data collected	**Date Collected**
Emergence:	Jun 12 – Jun 20
Stand Rating:	Mid Jul
Vigor:	Mid Jul

Table 2: Spring 2019 Soil Test

	Available	Needed
N	74 lb/ac	130 lb/ac
P	15 ppm	25 lb/ac
K	189 ppm	10 lb/ac

Table 3: Added Fertility

Blend	Blend (actual lbs/ac)	Actual lbs N	Actual lbs P
46-0-0	117.1	53.88	0
11-52-0-0	19.23	2.12	10
Total	-	56.0	10

N sidebanded: P banded with seed

Table 4: Herbicide Application

Crop stage	**Date**	**Product**	**Rate**
Pre-emerge	May 23	Glyphosate	640 ml/ac
In-crop	June 10	Coragen	50 ml/ac
	June 19	Quizalafop	300 ml/ac
		Lagon	250 ml/ac
	July 19	Decis	150 ml/ac
	August 2	Coragen	60 ml/ac
	August 21	Coragen	60 ml/ac
Desiccation	September 17	Reglone	1 L/ac