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Double-Cropped Field Pea Crop Rotation Study

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Abstract

Farmers are continually searching for a third crop to complement the corn-soybean rotation. Field peas can be substituted for most of the soybean meal in swine rations and is more economical than soybean meal, so there is a huge potential market for field peas in Iowa. Field peas are a short season crop which makes double cropping a potential possibility.

Disciplines

Agricultural Science | Agriculture

Double-Cropped Field Pea Crop Rotation Study

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Introduction

Farmers are continually searching for a third crop to complement the corn-soybean rotation. Field peas can be substituted for most of the soybean meal in swine rations and is more economical than soybean meal, so there is a huge potential market for field peas in Iowa. Field peas are a short season crop which makes double cropping a potential possibility.

Materials and Methods

The trial consists of three crop rotations that were established in 2005 and will continue through 2008. One of the crop rotations includes field peas double cropped after winter wheat and another rotation includes soybeans double cropped after field peas. These rotations are being compared with the standard corn-soybean rotation. The three crop rotations are; 1) corn-soybean, 2) corn-field peas/soybean, and 3) corn-soybean-winter wheat/field peas. In 2007, the double-cropped soybeans were replaced with two double-cropped milo varieties from Legend Seeds; TR418, and LM5001. Each crop in each rotation was grown in every year of the trial.

Two field pea varieties were grown in rotation 2, and three field pea varieties were used in rotation 3. In rotation 3, three planting dates were used in 2005, two in 2006, and 1 in 2007. All treatments were replicated 4 times in a randomized complete block design. All plots were 20 ft wide by 40 ft long and were machine harvested for yield. A winter pea variety was also planted in a separate trial in the fall of 2005 and 2006. Planting and harvest dates are summarized in Table 1.

Results and Discussion

Because of the hot, dry weather, 2005 was not an ideal year for double cropping. However, the field pea followed by double-cropped soybean rotation showed some promise. Both pea varieties yielded 52 bushels/acre. The measured yield of the double-cropped soybeans was only 9 bushels/acre, but there was a lot of harvest loss due to the difficulty of getting the soybeans to run through the combine head because of their short height. The same variety planted a few days earlier in larger plots yielded 26 bushels/acre. Both pea varieties had stands of over 300,000 plants/acre, which was the goal. Pea yields were considerably lower in 2006, partly due to the later planting date, poor plant stands, and unusually hot temperatures during flowering. Yields were also lower than desired in 2007, possibly due to the excess spring rains and warmer than normal temperatures during flowering. In 2006, the winter pea variety Specter yielded 30 bushels/acre, with similar yields for both planting dates. The peas matured at the same time as the spring peas. In 2007, the Austrian winter peas winter-killed.

Poor yields were obtained in all three years with all field pea varieties and planting dates when the peas were planted in July following winter wheat. The low yield was partly due to the poor pea stand establishment, because of the dry soil conditions at planting time (Table 3).

Temperatures were also warmer than normal in all three years in August when the peas were blooming, which also would have reduced yields. There also was more powdery mildew with the peas planted in July. The peas planted on the last planting date (July 28) in 2005 had the highest yield, probably because they escaped some of the August heat, but none of the summer planted peas were worth harvesting in 2006 or 2007. Yields for all crops are summarized in Table 2.

Despite the upper leaves of the milo being damaged by an early frost in mid-September, the milo yields were good, with the LM5001 yielding 92 bushels/acre and the TR418 yielding 80 bushels/acre. Double-cropped Milo after peas shows the most promise of all of our pea rotations.

Acknowledgements

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Table 1. Planting and harvest dates for field peas and double-cropped soybeans and milo.

	2005	2006	2007
Spring pea planting date	3/28	4/11	3/20
Spring pea harvest date	7/5	7/6	7/3
Double-cropped soybean planting date	7/5	7/7	---
Double-cropped milo planting date	---	---	7/3
Summer pea planting date(s)	7/11; 7/18; 7/28	7/20; 8/1	7/23
Winter pea planting date(s)	10/12; 10/24	9/28	---
Double-cropped soybean harvest date	10/26	10/25	---
Double-cropped milo harvest date	--	--	10/30
Summer pea harvest date	10/26	NH*	NH*

*Not harvested – very few harvestable peas.

Table 2. Crop yields in the three rotations and three years in bushels/acre.

	2005	2006	2007	Mean
Rotation 1				
Corn	176	194	204	191
Soybean	54	55	55	55
Rotation 2				
Corn	169	188	199	185
Field pea	52	25	35	37
Soybean after pea	9	21	--	15
Milo after pea	--	--	86	86
Rotation 3				
Corn	162	197	220	193
Soybean	62	55	53	57
Winter wheat	74	88	56	73
Field pea after wheat	13	0	0	4

Table 3. Field pea yields and stand counts in 2005–2007.

Year	Pea Variety	Spring peas		Summer peas	
		Stand (thousands/A)	Yield (bushels/A)	Stand (thousands/A)	Yield (bushels/A)
2005	WFP0097	337	52	224	11
2005	Eclipse	307	52	189	14
2005	Admiral	----	--	186	15
2006	Striker	181	21	171	0
2006	Admiral	183	29	198	0
2006	Midas	----	--	209	0
2007	Admiral	281	33	106	0
2007	Circus	286	37	76	0
2007	Marque	---	--	76	0