

# **ECONOMICS OF NO-TILL ANNUAL SPRING CROPPING SYSTEMS PROJECT, RITZVILLE, WA**

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In 1997, Washington State University conducted a no-till annual spring cropping systems project in Adams County, near Ritzville, WA. The objective of this study was to determine the long-run feasibility of diverse, cereal based, no-till cropping systems for low-rainfall areas of the inland Pacific Northwest. Spring crops included yellow mustard (Y.M.), safflower (Saff.), soft white spring wheat (SWSW), and spring barley (S.B.). With these spring crops, researchers maintained three rotations: four-year Saff./Y.M./SWSW/SWSW, two-year S.B./SWSW, and continuous SWSW.

Table 1 shows the yields for each crop per rotation throughout 1997 to 2001. After the fourth year, Saff. was discontinued from the four-year rotation. However, in 2001, the remaining crops of the original 4-year rotation were planted in the original sequence. To permit estimating profitability of the 4-year rotation for 2001, the profit for Saff. was estimated based on its historical relationship with Y.M.. Tables 2 and 3 summarize revenues, costs, and net returns per rotational acre for the three rotations. Continuous SWSW provided the highest net returns at \$8.52/ac over five years. This rotation had an intermediate profit risk level over the five years with a standard deviation of \$40.39/ac.

Over five years the Saff./Y.M./SWSW/SWSW rotation was the least competitive, with a loss of -\$9.43 per rotational acre. With the exception of 1997, this rotation experienced negative net returns. However, Saff./Y.M./SWSW/SWSW had the lowest risk over five years with a standard deviation of \$36.06/ac.

In 2001, inadequate soil moisture contributed to poor yields and negative net returns for all rotations. Table 2 shows the drought negatively affected spring barley/SWSW net returns. During 2001, this rotation had the lowest revenues per rotational acre of \$34.88. With total costs at \$80.88/ac for barley/SWSW, this rotation lost \$51.96/ac in 2001 (Table 3). Total costs include all costs including a return for the operator's labor and land and machinery investment. Interestingly, Saff./Y.M./SWSW/SWSW fared the best in the drought year. At -\$37.55/ac net returns over total costs in 2001, the oilseed rotation earned \$4.60 more than the second best rotation, continuous SWSW. The drought reduced the net returns over all rotations by an average of \$10.78/ac. Over 1997-2001, continuous SWSW remained the only profitable rotation with average net returns over total costs of \$8.52/ac.

**Table 1. Crop Yields from all Rotations, Continuous No-till Spring Cropping Systems Project, Adams County, WA, 1997 - 2001**

Rotation		Units	1997	1998	1999	2000	2001	5-yr Avg.
1. Four-Year	Safflower	lb/acre	1420	720	1040	600	702 <sup>a</sup>	896 <sup>a</sup>
	Yellow Mustard	lb/acre	1430	340	110	490	350	544
	Spring Wheat	bu/acre	63.8	41.0	27.0	40.0	8.0	36.0
	Spring Wheat	bu/acre	57.9	37.1	25.0	38.0	6.0	32.8
2. Two-Year	Spring Wheat	bu/acre	64.8	40.0	28.0	44.0	12.0	37.8
	Spring Barley	ton/acre	2.30	1.13	0.76	1.30	0.35	1.17
3.	Continuous Wheat	bu/acre	64.0	41.0	27.0	43.0	14.0	37.8

<sup>a</sup> 2001 Safflower yield is estimated for 2001.

**Table 2. Revenues and Costs by Year, Continuous No-till Spring Cropping Systems Project, Adams County, WA, 1997 - 2001**

Rotation	Year	Revenue	Var. Cost	Total Cost
		--- \$ per rotational acre ---		
Saff/Y.M./SWSW/SWSW	1997	187.73	55.78	135.09
	1998	97.40	56.06	110.64
	1999	78.18	62.20	109.30
	2000	98.22	69.57	116.13
	2001 <sup>a</sup>	43.33 <sup>a</sup>	51.58 <sup>a</sup>	80.88 <sup>a</sup>
SWSW/Spring Barley	1997	205.51	60.22	144.88
	1998	114.72	53.98	110.32
	1999	79.00	55.38	99.45
	2000	128.59	71.09	127.62
	2001	34.88	55.67	86.83
Continuous SWSW	1997	215.04	60.22	148.40
	1998	137.76	54.00	118.36
	1999	90.72	55.16	103.48
	2000	144.48	70.86	133.03
	2001	47.04	55.28	89.19

<sup>a</sup> 2001 Safflower yield is estimated.

**Table 3. Comparison of Net Returns by Rotation and Year Between for Three No-Till Spring Crop Rotations, Adams County, WA.**

Rotation	Net Returns Over Total Costs					1997 - 2000		1997 - 2001	
	1997	1998	1999	2000	2001	Avg.	S.D.	Avg.	S.D.
	----- \$ per rotational acre -----								
Saff/YM/SWSW/ SWSW	52.64	-13.23	-31.12	-17.91	-37.55 <sup>a</sup>	-2.41	37.47	-9.43 <sup>a</sup>	36.06 <sup>a</sup>
SWSW/Spring Barley	60.63	4.40	-20.45	0.97	-51.96	11.39	34.62	-1.28	41.25
Continuous SWSW	66.64	19.40	-12.76	11.45	-42.15	21.18	33.25	8.52	40.39

<sup>a</sup> 2001 Safflower yield is estimated.