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Objective Analysis

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Representative Enterprise Budgets for Pea Grazing, Haying, and Harvest for Seed

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Summary

This policy issues paper presents representative enterprise budgets for the inclusion of dry edible peas into a wheat-based dryland rotation in Central Montana. Three uses of peas are considered: grazed by livestock, harvested for seed, and hayed. Peas have generated significant interest in dryland wheat systems recently as a potential replacement for fallowing in years with sufficient soil moisture. Peas fix some nitrogen, have other agronomic benefits, and with good stands are also competitive with many weeds. Peas do however have the potential to reduce soil moisture for subsequent crops compared to summer fallow.

The nitrogen benefits of peas and their effect on soil moisture availability for subsequent crops are being further studies through the USDA-WSARE grant that has partially supported this work. Estimates of pea yields, their nitrogen benefits, and their effect on other crop nutrients are used here, but will be revised when more information is obtained after the 2008 growing season.

The pea budgets below report estimated net returns for both a high and a low yield for peas in three separate enterprises: grazing, harvest for seed, and haying. A no-till (chemical) fallow budget is also included. Representative agronomic practices are assumed to be used in each enterprise.

There are some factors that are not included in the budgets. These include water loss from peas for subsequent wheat crop, compaction of soil by livestock under pea grazing, and benefits to breeding program of having livestock concentrated during the breeding season while grazing peas. The budgets also exclude costs of farm labor, management, and land costs.

Herbicide application rates are consistent with Monsanto's 2008 RT3 North Central RT3 recommendations for good growing conditions under moderate weed pressure. Generic Glyphosate and other generic herbicides are used in these budgets.

To the extent that soil moisture conditions support planting peas as a substitute for fallow, net returns to any of the three pea enterprises are positive under both the high and the low yield scenarios. Water loss from peas may be quite significant in the enterprise where peas are harvested for seed. These positive net returns should be evaluated relative to foregoing fallowing costs estimated to be more than $28 per acre. Note however, that winter pea may not be hardy enough to survive the winter conditions in some geographical locations in Montana, especially in eastern and northern Montana.

Notes

Unpublished guidelines from the Monsanto Company, "2008 RT3 Rate Recommendations."

Fertilizer Price Source: Rocky Mountain Supply, Belgrade, MT.

Herbicide Price Source: NDSU www.ag.ndsu.edu/weeds/w253/w253-5a.htm and phone interviews with selected producers in North Central Montana.

Pea Price Source: STAT Communications, Ltd. Cash price in mid-May at: www.statpub.com/stat/prices/spotbid.html

Representative Enterprise Budget for Peas for Grazing by Cattle, Minimum Till System After Spring Wheat. High and Low Yield Scenarios. 2008

Central Montana

Expected Gross Income:					
		High Yield Scenario		Low Yield Scenario	
Unit	Price	Yield	Amount	Yield	Amount
AUMS	$20	1.75	$35	1.0	$20

Expected Variable Production Costs:				
	Unit	Price	Quantity	Amount
Seed & Inoculant	Lbs.	$0.10	100	$10.00
Glyphosate Post Grazing	Oz.	$0.25	20	$ 5.00
Sufactant & Am. Sulfate				$ 0.34
Machinery Operating Costs	Per Acre			$13.70
Interest Costs on Operating (7%)	Per Acre			$ 2.03
Total Operating Costs	Per Acre			$31.07
Expected Net Fertilizer Gains	Per Acre			$12.75
Returns Above Operating: High Yield				$16.68
Returns Above Operating: Low Yield				$ 1.68

The AUM value assumes a 40% loss from grazing vs. haying. An AUM is taken to be 900 lbs./month for peas (30 lbs./day, high value forage).

Unlike harvested peas, no post-emerge (Assure II) or Sonolan used since the pea crop is grazed. Glyphosate is applied after grazing to ensure minimal water loss.

Nitrogen benefit from peas: The peas are expected to put 40 lbs. of Nitrogen back into soil that will be available for the next crop. Additionally, cows are likely to leave 90% of nutrients on field, with the rest leaving as meat and volatilization. The urea price in 2008 is $.375. With cow manure gains and peas giving 50 lbs. of Nitrogen at a urea rate, the short-term gain in Nitrogen is $18.75 per acre.

Nitrogen losses due to meat: Cow/calf gain per day from 1.75 to 2.5 lbs. per day. Meat 20% protein, one lb., protein 6.25% Nitrogen per day. This translates to very little nitrogen lost per AUM due to uptake in meat, ranging from .65625 lbs. to .9375 lbs. per AUM.

Phosphorus use: The grazed peas are taken to use 15-20 lbs. of P2O5 (11-52-0). The P2O5 price in 2008 is $0.60. Budgeting 10 lbs. of P2O5 would cost $6.00 per acre.

Net fertilizer gains: Nitrogen gains less Phosphorous losses are $18.75 - $6.00 = $12.75. Although some losses of potassium and sulfur from beef leaving field expected, they are expected to be small and are ignored.

Representative Enterprise Budget for Peas Harvested for Seed, Minimum Till System After Spring Wheat. High and Low Yield Scenarios. 2008

Central Montana

Expected Gross Income:					
		High Yield Scenario		Low Yield Scenario	
Unit	Price	Yield	Amount	Yield	Amount
Lbs.	$0.08	1800	$144	1200	$96

Expected Variable Production Costs:				
	Unit	Price	Quantity	Amount
Seed & Inoculant	Lbs.	$0.10	150	$15.00
Sonolan 10G pre-plant	Lbs.	$1.10	7.5	$8.25
Assure II Post Emerge, if needed	Oz.	$1.04	8.0	$8.32
Machinery Operating Costs	Per Acre			$29.40
Interest Costs on Operating	Per Acre			$4.27
Total Operating Costs	Per Acre			$65.24
Expected Net Fertilizer Gains	Per Acre			$2.25
Returns Above Operating: High Yield				$81.01
Returns Above Operating: Low Yield				$33.01

The loan rate for peas is $6.12 per cwt.

Machinery operating costs for harvested peas are 10% higher than for spring wheat due to slower harvesting speeds (2 mph vs. 3.5 mph for spring wheat). Budgets assume straight cutting using a draper header.

Nitrogen benefit from peas: Harvested peas should give 30lbs of Nitrogen to soil as short-term available Nitrogen. The urea price in 2008 is $.375. Total gains $11.25 per acre.

Phosphorus use: Use 15-20 lbs. of P2O5 (11-52-0). The P2O5 price in 2008 is $0.60; budgeting 15 lbs. of P2O5 would be $9.00 per acre.

Net fertilizer gains: Nitrogen gains less phosphorus losses are $11.25 - $9.00 = $2.25 per acre. Although some losses of potassium and sulfur, they are expected to be small and are ignored.

Representative Enterprise Budget for Hayed Peas, Minimum Till System After Spring Wheat. High and Low Yield Scenarios. 2008

Central Montana

Expected Gross Income:					
		High Yield Scenario		Low Yield Scenario	
Unit	Price	Yield	Amount	Yield	Amount
Tons	$100	1.5	$150	1.0	$100

Expected Variable Production Costs:				
	Unit	Price	Quantity	Amount
Seed & Inoculant	Lbs.	$0.10	100	$10.00
Glyphosate post haying	Oz.	$0.25	20	$ 5.00
Sufactant and Am. Sulfate				$0.34
Machinery Operating Costs	Per Acre			$76.20
Interest Costs on Operating (7%)	Per Acre			$6.41
Total Operating Costs	Per Acre			$97.95
Expected Net Fertilizer Gains	Per Acre			$6.00
Returns Above Operating: High Yield				$58.05
Returns Above Operating: Low Yield				$8.05

Machinery operating based on swathing, round baling, and stacking at an average yield (1.25 tons/acre) at $50 per ton. Estimated haying costs are from variable cost and custom rate information.

Nitrogen benefit: Hayed peas putting 40 lbs. of Nitrogen back into soil as short-term available Nitrogen. Urea price in 2008 is $.375 indicated a Nitrogen gain of $15 per acre.

Phosphorus use: Use 15lbs. of P2O5 (11-52-0). The P2O5 price in 2008 is $0.60. Budgeting 15 lbs. of P2O5 would be $9.00 per acre.

Net fertilizer gains: Nitrogen gains less phosphorous use is $15.00 - $9.00 = $6.00 per acre. Although some losses of potassium and sulfur are expected; they are expected to be small and ignored.

Representative Enterprise Budget for Fallow, No-till System After Spring Wheat. 2008

Central Montana

Expected Production Costs				
	Unit	Price	Quantity	Amount
Herbicide, glyphosate	Oz.	$0.25	76	$19.00
Herbicide, 2-4D, LV6	Oz.	$0.15	20	$3.00
Surfactant and Am. Sulfate				$1.37
Machinery Operating Costs	Per Acre			$2.97
Interests Costs on Operating	Per Acre			$1.84
Total Operating Costs	Per Acre			$28.18

Herbicide Treatments: Sept 15th (after Wheat harvest), May 1, June 15, August 1. The May (June) Treatments include 2,4-D LV6 at an 8 (12) oz. rate. Glyphosate rates are 16 oz. on Sep. 15th, 16 oz. on May 1, 20 oz. on June 15th, and 24 oz. on August 1. Surfactant and Ammonium Sulfate used for each herbicide pass at a total cost per pass of $0.34.

Note that the Sept. 15th post-harvest application is not included in the 2008 Monsanto RT3 recommendations.