Effects of the Triple Base Proposal on Planting Decisions for Potatoes and Dry Edible Beans

by

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Abstract: Future farm legislation is considering a proposal to divide a farmer's acreage base for program crops into idled land, supported acreage that would remain planted with the program crop, and an unsupported third portion that could be planted with any permitted alternative crop. Analysis of net returns indicates that if this proposal were adopted, substantial economic incentives would encourage producers to shift unsupported program crop acreage into the production of potatoes and dry edible beans, provided they are approved for triple base plantings. This study focuses on potatoes and dry edible beans because they compete with program crops in the major production areas. Even small increases in the production of potatoes and dry edible beans could sharply reduce prices and revenues for producers of these crops.

Keywords: Triple base, potatoes, dry edible beans, net returns.

A triple base proposal is being considered for inclusion in future farm legislation. Under this proposal, a farmer's acreage base for the major program crops (wheat, corn, sorghum, barley, oats, rice, and cotton) would be divided into three parts—idled land, supported program crop plantings, and a new unsupported third portion.

The amount of land required to be idled would continue as under current legislation, determined by crop-specific acreage reduction programs and paid land diversions. Supported program crop acreage would still receive farm program price and income supports. This supported acreage would need to be planted with the original program crop to protect a base history, as in current programs.

The triple base proposal would allow farmers to plant alternative program crops or approved nonprogram crops on the new third portion of their acreage base without losing base history for the original program crop. However, they would not receive deficiency payments associated with that portion of their acreage base, even if they chose to continue growing the original program crop on that land. Additionally, production from that land may also be ineligible for nonrecourse loans. The triple base proposal would provide more planting flexibility to farmers who currently grow program crops, while reducing Federal expenditures for farm programs.

This article uses a net returns framework to analyze the potential for switching triple base acreage to potatoes and dry edible beans if they become approved nonprogram crops in a triple base program. These nonprogram crops are considered because of their proximity to base acreage: they are often grown in rotation with program crops.

Planting Flexibility

Planting flexibility would be enhanced by two features of the triple base proposal. These features would allow alternative crops, such as potatoes and dry edible beans, to compete directly with the original program crop in farmers' planting decisions for the triple base acreage.

First, the base history for the original program crop would be preserved as long as an approved crop is planted on the third portion. Under current legislation, farmers must plant the program crop on all base acreage except idled land to maintain their full acreage base history for target price and Commodity Credit Corporation loan eligibility, a criterion that limits their response to market signals in planting decisions.

Second, because farmers would not receive deficiency payments for triple base acreage, they would make planting decisions for this land based only on a comparison of expected returns from the marketplace, not from farm program payments. If an alternative crop would provide greater market returns than the original program crop, farmers could increase their profits by switching some acreage to the alternative crop, thereby partly offsetting the deficiency payment losses.

Net Returns Analysis of the Triple Base Proposal

Growers' net returns for crops grown on the unsupported third portion of the acreage base would consist of market revenues minus variable costs of production.

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Breakeven prices, defined as prices that generate the same net returns per acre from the alternative crop as from the original program crop, were calculated for potatoes and dry beans in selected production areas where they are grown or could be grown on the same farms as program crops. These breakeven prices illustrate the economic incentives to switch acreage from program to nonprogram crops under the triple base proposal.

The magnitude of likely acreage shifts and resulting market impacts then would depend on farmers' price expectations and the portion of the total base designated as unsupported. If farmers expect prices for an alternative crop to exceed the breakeven level, they would improve returns by switching to that crop. But if the expected price of the alternative crop is lower than its breakeven price, farmers' net returns would be higher if they plant the original program crop.

It is assumed for this analysis that potatoes and dry edible beans would be approved alternative crops for triple base plantings. However, the specific list of allowable crops would need to be included in the triple base legislation. The analysis also assumes that the triple base proposal would be enacted early enough to affect 1990 planting decisions. The assumptions for yields and production costs used to derive breakeven prices are representative of those farmers would use in planning for 1990. The net returns framework can easily be adapted to derive breakeven price relationships for other years by using different assumptions for yields and variable costs.

Potatoes

Potato-corn breakeven prices were estimated for Michigan and Wisconsin to evaluate the economic incentives for switching from corn to potatoes under the triple base proposal. Potato-wheat and potato-barley breakeven prices were estimated for the North Dakota-Minnesota Red River Valley, Idaho, and Washington State to evaluate the economic decision of switching among these crops. Table A-1 shows the assumptions used regarding variable costs and yields for the program crops and potatoes in each region.

Potato-corn breakeven prices range from $3.18 per hundredweight (cwt) with a corn price of $1.50 a bushel, to $3.92 per cwt with a corn price of $3.50 a bushel (fig. A-1). If growers expected the 1990 corn price to be $2.08 per bushel (the mean of USDA's August corn price forecast for the 1989 crop)[1], the potato price would have to be about $3.40 per cwt for farmers who switched to potatoes to break even. If potato price expectations exceed $3.40, farmers with a corn base would find it profitable to switch unsupported triple base acreage from corn to potatoes. If potato prices were expected to be lower than $3.40, it would be more profitable to continue growing corn on that acreage.

Potato-wheat breakeven prices range from $2.62 per cwt in Washington State if wheat prices are $2.50 a bushel, to $3.28 per cwt in the North Dakota-Minnesota Red River Valley if wheat prices are $4.50 a bushel (fig. A-2). If wheat price expectations are $4.05 per bushel (the mean of USDA's August price forecast for the 1989 wheat crop), breakeven potato prices would range from about $2.80 to $3.20 per cwt.

[1] Price expectations for program crops in 1990 are assumed to be based on 1989 price outcomes, represented here by August USDA price forecasts (1).

Table A-1--Yield and cost assumptions for potato analysis

Category and States	Program crop assumptions: Corn	Wheat	Barley	Potato assumptions
	------ Bu./acre -------			Cwt/acre
Yields:				
Michigan & Wisconsin	115	---	---	311
North Dakota & Minnesota	---	36	55	181
Idaho	---	70	108	300
Washington	---	60	100	550
	--------- Dollars/acre ----------			
Variable costs:				
Michigan & Wisconsin	125	---	---	942
North Dakota & Minnesota	---	43	47	474
Idaho	---	102	97	756
Washington	---	64	122	1,356

--- = Not applicable.

Figure A-1.
Potato-Corn Breakeven Prices, 1990: Triple Base Proposal

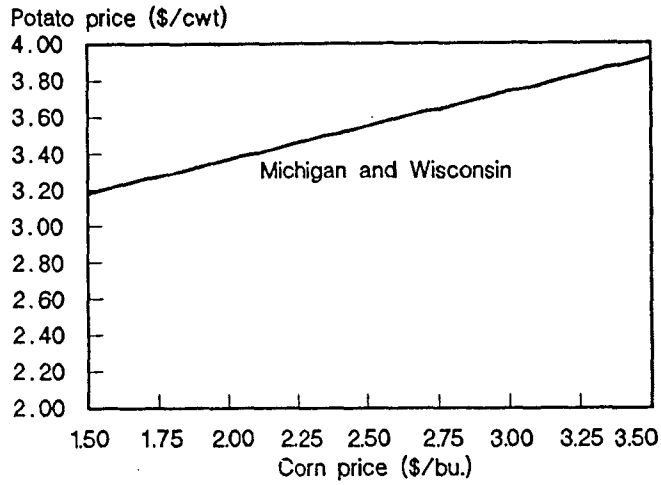


Figure A-2
Potato-Wheat Breakeven Prices, 1990: Triple Base Proposal

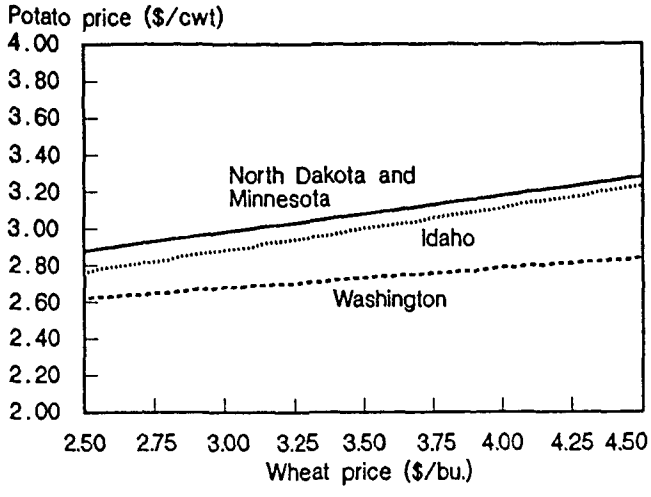
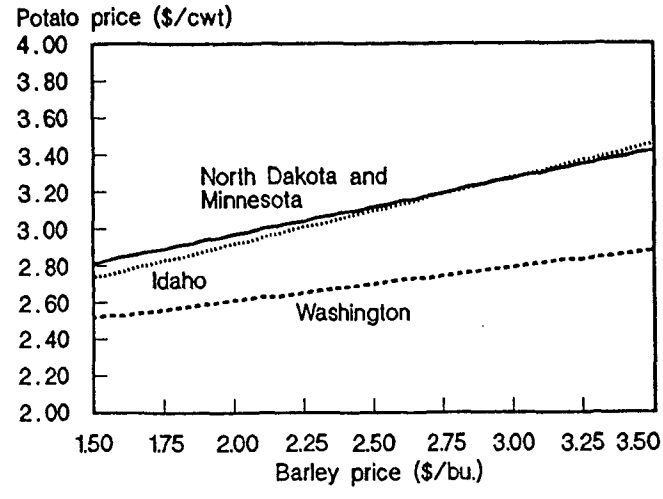


Figure A-3
Potato-Barley Breakeven Prices, 1990: Triple Base Proposal



For barley, breakeven potato prices range from $2.52 per cwt in Washington State if the barley price is $1.50 a bushel, to $3.46 per cwt in Idaho if the barley price is $3.50 a bushel (fig. A-3). If farmers expect barley prices for 1990 to be at the mean of USDA's August forecast for the 1989 crop ($2.25 per bushel), breakeven potato prices would range from $2.65 to about $3.05 per cwt.

If potato price expectations exceed $3.40 a cwt and corn, wheat, and barley price expectations are near the means of their current 1989 forecasts, farmers would benefit from switching triple base acreage to potatoes. Table A-2 shows the acreages involved. For potatoes, 1989 plantings are shown. For the program crops, 1989 enrolled base acreages are shown. Assuming similar program participation rates, these acreages approximate the amount of land to which a triple base factor would be applied. Even a triple base factor as low as 10 percent would free more program crop base acreage than is currently planted with potatoes.[2]

[2] Triple bases could be calculated as a percent of permitted plantings or as a percent of the overall acreage base. The latter approach would make the determination of the size of the unsupported triple base acreage independent of crop-specific acreage reduction programs.

Table A-2--Program crop enrolled base and potato acreage, 1989

States	Enrolled base for program crops: Corn	Wheat	Barley	Potato acreage
	1,000 acres			
Michigan & Wisconsin	5,099	---	---	111
North Dakota & Minnesota	---	13,856	3,550	198
Idaho	---	1,074	528	355
Washington	---	2,315	682	118

--- = Not applicable.
Sources: (2), (3).

Because net returns favor the planting of potatoes, supplies could increase sharply under the triple base proposal. However, potatoes require specialized production skills and large investments in specialized growing, harvesting, storage, and packing machinery. Potatoes also require large amounts of water during the summer months. Further, many potato growers contract with a buyer before committing very much additional acreage to potatoes. These factors would probably limit the amount of acreage shifted to potatoes in the short term under the triple base proposal.

Production shifts probably would occur on those farms that already have diversified into potatoes, rather than on those that currently do not produce potatoes. Nonetheless, even small increases in potato output cause relatively large price changes: a 1-percent rise in potato production typically leads to a 4-percent decline in prices (4). Consequently, allowing potatoes to be an alternative crop for triple base plantings likely would lower prices and revenues for potato growers for 1-2 years while acreage shifted between potatoes and program crops.

Dry Edible Beans

Dry bean-corn breakeven prices were estimated for Michigan and Colorado. Dry bean-barley breakeven prices were estimated for Colorado. Analysis was limited to these areas because comparable cost data were not available for other areas. Navy beans dominate the Michigan dry bean market. Pinto beans dominate the Colorado market. Table A-3 shows the assumptions used for program crops and dry beans regarding yields and variable costs of production.

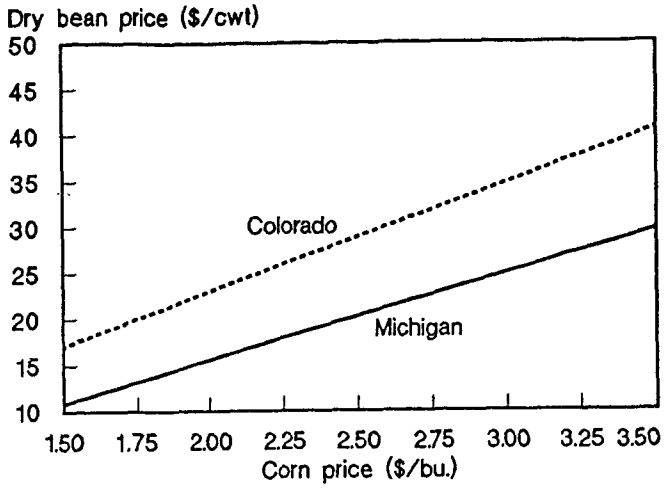
Dry bean-corn breakeven prices range from $10.85 per cwt in Michigan if the corn price is $1.50 a bushel, to over $40 per cwt in Colorado if the corn price is $3.50 a bushel (fig. A-4). Dry beans would be competitive with corn in Michigan if growers expected dry bean prices to exceed $16.50 per cwt and corn prices to equal $2.08 a bushel (the mean of the current USDA price forecast range for the 1989 corn crop). Dry bean price expectations would need to exceed $24 per cwt, however, for dry beans to be competitive with corn in Colorado.

Table A-3--Yield and cost assumptions for dry bean analysis

Category and State	Program crop assumptions: Corn	Program crop assumptions: Barley	Dry bean assumptions
	-- Bu./acre --		Cwt/acre
Yields:			
Michigan	110	---	11.7
Colorado	165	68	14.0
	------- Dollars/acre ------		
Variable costs:			
Michigan	126	---	88
Colorado	174	120	166

--- = Not applicable.

Figure A-4
Dry Bean-Corn Breakeven Prices, 1990: Triple Base Proposal



Dry beans would be more competitive with barley than with corn in Colorado. Dry bean-barley breakeven prices in Colorado range from $10.57 to $20.30 per cwt when barley prices range from $1.50 to $3.50 a bushel (fig. A-5). If the expected barley price is $2.25 a bushel (the middle of the current USDA barley price forecast range for the 1989 crop), dry bean prices would have to exceed $14.20 a cwt to make the switch of triple base barley acreage to dry beans profitable in this State.

Figure A-5
Dry Bean-Barley Breakeven Prices, 1990: Triple Base Proposal

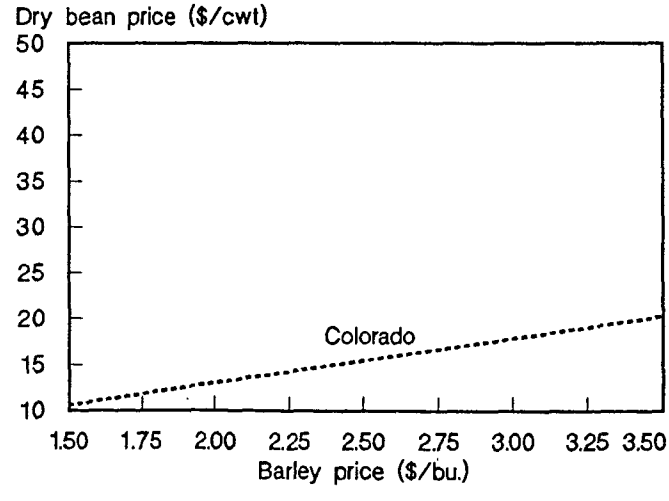


Table A-4--Program crop enrolled base and dry bean acreage, 1989

State	Enrolled base for program crops: Corn	Enrolled base for program crops: Barley	Dry bean acreage
	1,000 acres		
Michigan	2,371	---	340
Colorado	740	182	185

--- = Not applicable.
Sources: (2), (3).

As with potatoes, Michigan's enrolled program crop base acreage is considerably larger than its dry bean land (table A-4). Colorado's enrolled barley base is about the same size as its dry bean acreage. If very much land were switched from program crops to dry beans, localized impacts on the production and prices of some types of beans could be significant. Acreage and production of dry beans would likely change more in the short term than that of potatoes. Growers can switch more easily from program crops to dry beans than to potatoes because dry bean production has lower requirements for specialized equipment and production skills and water than potato production. On the other hand, dry bean prices are less responsive to changes in output than are potato prices. Nevertheless, the triple base proposal likely would increase production, lower prices, and reduce dry bean producers' receipts for 1-2 years while acreage shifted between dried beans and program crops.

Conclusions

The triple base proposal would allow farmers to substitute approved alternative crops on part of their program crop acreage base without reducing their base history. However, farmers would not receive deficiency payments on that portion of their acreage, and production from that land also may not be eligible for nonrecourse loans, even if the original program crop is grown on the triple base acreage. Consequently, potential alternative crops would compete with each other and with the original program crop based only on market returns, not farm program payments. The triple base proposal would free a large amount of program crop acreage compared with current plantings of potatoes and dry edible beans.

An analysis of net returns indicates that significant economic incentives would exist to plant potatoes and dry edible beans on unsupported triple base acreage, provided these nonprogram crops are approved for triple base plantings. Potatoes would be competitive with corn, wheat, and barley, while dry beans would be competitive with corn and barley.

Availability of irrigation water, high capital investment in specialized equipment, the need for specialized production skills, and the practice of contracting a large part of potato production would constrain the amount of triple base land switched from program crops to potatoes. But fewer barriers impede farmers from switching to dry beans. Small production changes could reduce prices and revenues of potatoes and dry edible beans for 1-2 years as acreage shifted between program crops and these nonprogram crops, and prices adjusted to new equilibriums.

References

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4. Zepp, Glenn and Eugene Jones. "Potato Prices' Relation to Supply and Demand Factors," *Vegetable Outlook and Situation*, TVS-229, July 1983. pp. 29-31.