



Agricultural policy reform: A proposal

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This proposal is not an official position of the U.S. Department of Agriculture, the Economic Research Service, or Purdue University. The opinions expressed are those of the authors. We thank the many colleagues and reviewers who gave constructive suggestions and criticism as we developed our proposal.

We want to encourage a major rethinking of U.S. agricultural programs to meet the new policy objectives.

We propose a major restructuring of U.S. agricultural programs. These programs can be restructured along lines suggested by the Ontario Market Revenue Plan to provide comprehensive risk management (gross revenue insurance) and forward planning prices for farm commodities. The new commodity programs would be simple, voluntary, comprehensive, non trade-distorting, friendly to sustainable agriculture, and reduce government budget exposure. These features are often absent from today's policies and programs which are based on the 1933 Agricultural Adjustment Act that was designed to meet other needs.

The Clinton-Gore administration has promised fresh policy approaches and new policy players. The public is dissatisfied with the old agricultural programs and their continuing income transfers to large farmers. However, the public does seem willing to support revenue stabilization to cushion market price variability and the yield variability that nature brings to agriculture. The public also is interested in resource stewardship and concerned about environmental quality. The time has come to begin a debate on farm programs that are really different.

The building blocks of our proposal are not new; but the combinations of program components and their potential are new. We do not suggest a complete decoupling at this time. Our proposal is to adapt and replace traditional commodity programs with certain components from the Ontario Market Revenue Plan, modernized parity, and the Brannan Plan. (See boxes on the Ontario and Brannan plans.)

What does our program look like?

Our voluntary program has two key features:

- Crop yield insurance that pays out at market prices for any shortfall of yield below a yield coverage level. Farmers would pay actuarially sound premiums, meeting the long term costs of this protection, as a requirement of joining the program.
- Commodity price stabilization (by deficiency payments to farmers) of any shortfall of market prices below a target price. This is then paid on the producer's own moving average yield. The price stabilization payments would be made from a stabilization fund which could be a revolving fund financed by farmers or government. Government could establish this fund and cover the initial losses.

Combined, the yield insurance and price support components provide comprehensive revenue insurance at some safety net level. Producers receive and keep all revenues from the marketplace. These are en-

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hanced by the program only when these fall below what society determines to be a safety net level through the mechanism of a target price and yield based on long-term moving averages.

It is critical, however, that the target price be linked to the market rather than be politically determined. Our target price is a percentage coverage level of a 10 to 15 year moving average of market prices that are indexed to current production costs. This indexed moving average price is similar to the modernized parity proposed by Teigen. Likewise, the yield coverage level is some percentage of the 10 to 15 year moving average yield for a given farm.

The Comprehensive Risk Management Feature

The yield and price insurance components provide a practicable form of comprehensive revenue insurance. Figures 1-A and 1-B show the operation of the plan for a typical producer under the program. The vertical axis shows expected gross revenue per acre (price times quantity) for a given acre of a farmer's land. The horizontal axis is the yield (quantity). The top black line gives gross revenue for the given acre of land at different yield and price levels and includes market revenues, yield insurance payments, and any price stabilization payments.

In figure 1-A, the market price is equal to or greater than the target price. At a yield above the yield coverage level all the revenue comes from the market. If the farmer's yield falls below the yield coverage level, the farmer receives a fixed revenue from that acre composed of market revenue based on actual yield and scaled crop insurance payments based on yield loss. Above the yield coverage level the farmer's revenue per acre increases as it is enhanced by the additional production sold at market prices.

In figure 1-B, the market price has fallen below the target price. As before, up to the yield coverage level of production the farmer receives market revenue and crop insurance payments based on the market price of the commodity. As the farmer's yield increases beyond the yield coverage level, the revenue

Provisions of the Ontario Market Revenue Program

The Ontario Market Revenue Program is Ontario's own unique version of the Gross Revenue Insurance Plan (GRIP) used in other parts of Canada. It was instituted in 1991/92 after a comprehensive review of province level and nationwide agricultural stabilization policies. The Ontario program combines

- crop insurance that pays indemnities to enrolled producers for shortfalls of yield below 80 percent of a producers own 10 year moving average of realized yields. Premiums are shared equally between the federal government, provincial government and the producer.
- income stabilization deficiency payments equal to any shortfall between the 'target price' (80 percent of a 15 year moving average of prices for that commodity indexed for changes in input prices, the IMAP) and the regional average price of the covered commodity. This is paid on the basis of the producer's own moving average yield. The deficiency payment stays the same regardless of the farmer's yield in a given year, and the farmer keeps the market revenue from improved yields. The program is financed the same way as the crop insurance.

Producers can enroll in either or both parts of the program. If producers wish to opt out of the program, they must give three years notice and remain out of the program for two years.

Actual enrollment has been 85 percent of eligible acreage in both years it has been available. Indemnity payments have exceeded premiums, as expected, to cover startup costs. However, payments have been in line with the levels forecast and the program is working as expected.

Similarities to the Brannan Plan and proposals to modernize parity

The Brannan Plan proposed supporting farm incomes at 100 percent of parity. To accomplish this, payments making up the difference between the parity level of income and a farmer's actual income at market prices would be paid directly to the farmer. An index of prices paid by farmers, the parity index, was to be used to adjust target revenues for changes in input costs. This feature is somewhat similar in its calculation to our proposal. The differences are (1) our proposal would be underwritten by separate premiums for the yield protection and the price protection instead of all being paid from tax revenues, (2) the revenue support would be set at safety net levels, maybe 80 percent of a modernized parity concept, (3) participation by large farms does not need to be limited in our proposal because it is insurance based.

Our plan uses a modernized parity concept. In redefining the parity index in the Agricultural Adjustment Act of 1948, lawmakers defined the parity price for a commodity as the moving average of prices received over the preceding 10 years divided by the index of prices received over the same period and multiplied by the current year's value of the index of prices paid (the parity index). By dividing and multiplying the ten year moving average by two different indices, the definition introduced a strong upward bias to parity prices—a bias not envisioned by early proponents of parity.

To repair the parity concept and remove the upward bias, Teigen proposed that the index of prices paid, the parity index, replace the index of prices received in the denominator of the parity price calculation. The Teigen formula is almost identical with the IMAP used here.

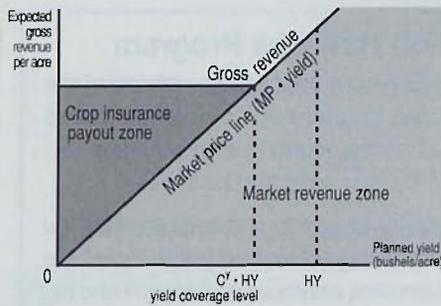


Figure 1A: The proposed policy: Market price = target price

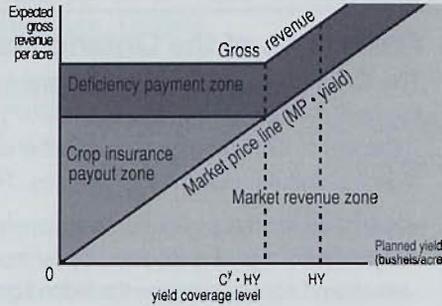


Figure 1B: The proposed policy: Market price below target price

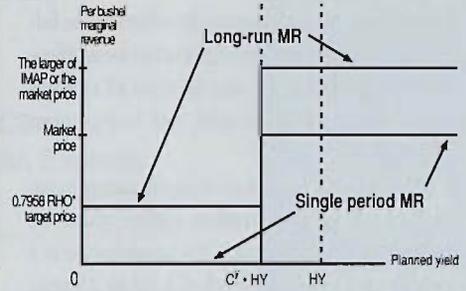


Figure 2: Forward planning prices

per acre increases by the amount of this additional yield times the market price. A deficiency payment is made calculated as the target price less the market price times the producer's own Historic Moving Average Yield (HY). (On the graph in figure 1-B, this payment is the distance along the vertical HY dotted line from the market price line to the gross revenue line.) Just as with the current U.S. program, the deficiency payment per acre is the same for a given year regardless of the actual yield on the farm.

The key to the program's stability, market orientation, and acceptability under GATT rests in the use of Historic Average Yields (HY) and long term Indexed Moving Average Prices (IMAP). The program will not cause a permanent escalation of production or target prices above market prices because increased production will cause current market prices to drop, thus lowering the Indexed Moving Average Price in future years.

The Forward Planning Price Feature

Farmers formulate their production plans based on expected future prices. One of the primary sources of instability in agriculture is that future market prices are not known with any certainty. Our proposal allows future minimum effective prices for commodities to be known with relative certainty, while market prices are allowed to seek their own level in any year. (See box on forward prices.) With much of the price uncertainty removed from farmers' gross revenue streams, farmers will be able to make better investment, crop mix, and management decisions.

Producers will want to determine long-term marginal revenue from both cash returns this year and future returns from increasing or decreasing yield history. The most profitable strategy for producers is then to select the yield at which the long-

term marginal revenue is equal to long-term marginal cost.

It is crucial to the operation of the program that the length of time for determining IMAP and the yield and price coverage levels be set and left unchanged for years. Frequent or purposeful changes of these, however well-meaning, will impair either the forward planning price feature or the cost containment feature of the program.

Producer revenues

In the three tables below, revenues and costs are compared for (i) not participating in any program, (ii) participating in current commodity and crop insurance programs, and (iii) participating in our program which has no set-aside or flexibility conditions. Revenues from the market place, crop insurance, and deficiency payments are reduced by the amounts of premiums paid to obtain the gross revenue after premiums for 100 acres in wheat, or the maximum allowable

Example: 1991/92 Gross cash revenues for wheat. Nonparticipation, the current program, and our program

Situation I: 100 acres wheat, normal 30 bushel yield, market price \$2.61/bu.

| | Non-participant | Current program | Our program |
|-------------------------------------|-----------------|-----------------|-------------|
| Gross cash revenues: | \$ | \$ | \$ |
| • From the market | 7,830 | 5,990 | 7,830 |
| • From crop insurance | --- | --- | --- |
| • From revenue program | --- | 2,364 | 1,680 |
| Less premiums paid | --- | (382) | (1,500) |
| Equals gross revenue after premiums | 7,830 | 7,972 | 8,010 |
| acres in wheat | 100 | 76.5 | 100 |

Situation II: 100 acres wheat, low 15 bushel yield, market price \$2.61/bu.

| | Non-participant | Current program | Our program |
|-------------------------------------|-----------------|-----------------|-------------|
| Gross cash revenues: | \$ | \$ | \$ |
| • From the market | 3,915 | 2,995 | 3,915 |
| • From crop insurance | --- | 1,497 | 1,957 |
| • From revenue program | --- | 2,364 | 1,680 |
| Less premiums paid | --- | (382) | (1,500) |
| Equals gross revenue after premiums | 3,915 | 6,474 | 6,052 |
| acres in wheat | 100 | 76.5 | 100 |

Situation III: 100 acres wheat, normal 30 bushel yield, market price \$3.45/bu.

| | Non-participant | Current program | Our program |
|-------------------------------------|-----------------|-----------------|-------------|
| Gross cash revenues: | \$ | \$ | \$ |
| • From the market | 10,350 | 7,918 | 10,350 |
| • From crop insurance | --- | --- | --- |
| • From revenue program | --- | 936 | --- |
| Less premiums paid | --- | (382) | (1,500) |
| Equals gross revenue after premiums | 10,350 | 8,472 | 8,850 |
| acres in wheat | 100 | 76.5 | 100 |

* The current program reflects the 1991-92 wheat program: \$4.00 target price, 15 percent ARP, 15 percent flex acres, 10 percent optional flex acres in wheat, wheat base of 90 acres, program yield of 27 bushels, and crop insurance coverage at 75 percent. Our example program reflects a 1991-92 IMAP of \$3.91, a price coverage level of 81 percent (same as effective target price under current programs) a yield coverage level of 75 percent, and a producer's moving average yield of 30 bushels per acre.

to be in compliance with set-asides under current programs.

The gross cash revenues of a representative wheat operation are favorable under our proposal compared to current programs if yields are near normal. Our proposal compares favorably with non-participation under either low prices or low yields. If the probability of either low prices or unfavorable yields is larger than about one chance in three, it would pay a wheat producer to participate in the program. In addition to the current cash income, a producer would receive the long term program benefit of guaranteed future revenue, with a current income equivalent in this example equal to 19 percent of IMAP (\$0.75 per bushel). The forward planning price for a participating farmer would be \$3.91, exactly equal to the wheat IMAP. Our projection shows that over time the wheat IMAP would decline to about \$3.60 by 1998/99 (in real 1992 dollars) and recover after that. Similar results are obtained for corn and soybeans.

Antecedents of the Plan

Our extension of the Ontario Plan has similarities with certain aspects of the Brannan Plan of 1949, which also proposed indexing a moving average of market prices. The Brannan Plan, however, was seen as raising farmers' net incomes in aggregate, and it foundered because of high government costs, the use of production controls, and benefit limitations to large farms. It suffered the organized opposition of many groups in a partisan and divided Congress.

Our plan and the Ontario Plan differ from the Brannan Plan in several respects:

- *Risk Management:* The philosophical basis of the Ontario Plan is comprehensive risk management, not support or subsidization of prices or incomes. The philosophical bases and operational design of our proposed plan are to provide comprehensive individual risk management and forward planning prices for agriculture, while distorting neither short-run market prices nor long-run production choices.

- *Market Orientation:* The levels of support in our plan should be at or below market prices, except in unusual circumstances. The support levels proposed in the

Forward planning prices

The forward planning prices become known with certainty and track the IMAPs almost perfectly if the price coverage level, C^p , is selected properly. These characteristics result from the inherent dynamics of moving averages; they hold regardless of the time path of the Indexed Moving Average Price. Technically, this works out as follows:

Producers will seek to gain the greatest profit by equating long term marginal revenue with long term marginal cost. The components of long-term marginal revenue are as follows:

1. The guaranteed minimum revenue per acre in the current year, $C^p \cdot \text{IMAP} \cdot C^y$, for yields below C^y . This component of marginal revenue is zero, because gross income is constant in this yield range.
2. The expected market revenue at the market price, for yields above C^y . This component is equal to the market price.
3. The current income equivalent of expected future revenue guarantees (through maintaining or building yield history, HY, over the entire range of yields). This component of marginal revenue is determined by (i) the length of the moving average period for yields, (ii) the real (inflation-adjusted) average cost of capital, and (iii) the expected proportion of support from the program (the expected revenue from deficiency payments divided by expected market revenue over the planning horizon). Shorter moving averages for yields, lower real costs of capital, and higher proportions of revenue from deficiency payments increase the future component of the planning price.

Combined, the three components form a (minimum) forward planning price that is certain this year, about 97 percent certain next year, about 95 percent certain two years out, and so on.

If the yield history, HY, covers (say) 15 years, the producer's real average cost of capital is 3 percent, and the expected proportion of support from the program over the planning horizon (which we'll call RHO) is 0.3, then the long-term marginal revenues are (see figure 2)

- (i) 0.7958 times RHO times the target price from zero yield up to the yield coverage level, C^y . The value 0.7958 is the present value of an annuity at 3 percent interest over 15 years, for 1/15th of the deviation of the current yield from the producer's historic yield;
- (ii) the larger of $(1 + 0.7958 \text{ RHO})$ times the target price, or the market price, for yields above C^y , which equals 1/1.2387 times the target price.

Hence, if the target price guarantee is set at 81 percent of IMAP (1/1.2387) then the forward planning prices for the subsequent years will equal the larger of expected market prices or IMAPs.

The forward planning prices only eliminate the 'noise' from supply or demand shocks without masking the underlying price signals.

Brannan Plan were alleged to result in prices that would remain above market prices, except in unusual circumstances.

- *Production Controls:* The Brannan Plan envisioned production controls to limit government cost exposure. Our plan is intended

to work without production controls.

- *Government Cost Exposure:* The government costs can be self-limiting and reduced from current levels, even during the transition from present programs. To lower

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Ag policy—looking ahead *continued*

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government costs, long term historical average prices and yields (IMAPs and HYs) and reasonable coverage levels that do not in and of themselves enhance prices and returns must be selected and maintained. If desired, the plan could be fully self-financing.

subsidized underutilized crop insurance. Moreover, any attempts by individual producers to "farm the programs" (practice moral hazard, i.e., behave so as to increase benefits) would lower that producer's own yield history and lower future coverage.

of \$10 per acre for price protection. By comparison, the projected 1992 CCC outlays for deficiency, disaster, and storage payments are \$7.3 billion. Moreover, the net outlays would decline to zero over a phase-in period of six to eight years—after that the program could be self-financing.

Our proposal allows future minimum effective prices for commodities to be known with relative certainty, while market prices are allowed to seek their own level in any year.

It reduces the regulatory burden of programs on farmers and the economy. It gets rid of conflicting provisions, ad hoc regulations, and the need for Congress to re-jigger farm supports every 5 years. Gone are nonrecourse loans, marketing loans, bases, flex acres, 0/92's, 50/92's, PIK certificates, and so on. It does away with ARP's, PLD's, the Farmer Owned Reserve, and other alphabets and supply management provisions. It does away with disaster payments and storage payments. All of these are complex for farmers and complex to administer. The administrators would simply substitute for all of the above (1) an individual yield history for each producer and crop, (2) a regional average market price received, (3) a Prices Paid Index.

What can our plan do for the U.S.?

There are several features of this program that make it extremely attractive. The Ontario version is already in place, and participation there covers 85 percent of farm acreage. Its basic component parts have been used in the United States for several years—target prices, crop insurance, and proposals for modernized parity. The important attributes of the proposal are as follows:

It meets our GATT objectives of market orientation. It reduces distortion of production and trade. Short-run market prices will be determined by supply and demand factors in the current year. Producer incentive prices can be no higher than the higher of prevailing market prices or the Indexed Moving Average Prices. Furthermore, it does not distort long run production choices because IMAPs reflect actual market prices received. If production is temporarily stimulated by payouts, the market prices received will be lower, thus lowering future IMAPs and off-setting the production stimulation.

It provides comprehensive risk management for agriculture. It provides a guaranteed minimum gross revenue at safety net levels without building in a permanent income transfer or accumulating stocks. Producers keep all market revenues. It can solve the current incongruity of providing both politically determined disaster payments and

It provides forward planning prices for agriculture. Forward planning prices track stabilized market prices; but market prices in any year are determined by market forces in that year. Markets clear each year; no surpluses are generated. Only the extremes from production and demand shocks are reduced by the moving average planning price, not the price signal. Relative planning prices adjust to reflect the production costs of the marginal producer or producing re-

It can provide a compliance require-

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gion and the value of the commodity in the marginal use. In addition, increases in productivity are automatically reflected in the market prices received and in changing weights in the prices paid index.

It reduces government budgetary exposure for commodities currently supported. Expenditures are targeted toward comprehensive risk-management objectives. Outlays for our program would be \$6.2 billion in fiscal 1992. This calculation assumes current effective support levels on 100 percent of the acreage in corn, wheat, and soybeans, including the 26 million acres in set-asides, and assumes an actuarially sound premium (including administrative costs)

ment for environmental objectives. Our program may be more effective as a compliance vehicle than current programs, even with lower budget costs. Broader coverage and higher participation rates are expected because the price risks for non-participants are increased whenever the producers' incentive price (which is equal to the IMAP) is greater than the expected market price. These increased price risks can stimulate higher program participation without additional budget costs over the current programs. Our plan can incorporate environmental/farm practice eligibility requirements instead of the regulations and prohibitions that are becoming more pervasive under

current programs. It also provides risk protection through the revenue insurance for farmers who innovate to adopt new technology that may be desired for environmental goals.

It strengthens public sector-private sector cooperation to provide crop insurance. Private insurers would supply actuarially sound crop yield insurance with public sector reinsurance to cover short-term adverse weather cycles, just as now. The public sector would administer the price stabilization fund, which may not be actuarially sound in the short run because of past U.S. or foreign government intervention in the markets. It can be actuarially sound in the long run as a price stabilization scheme if desired.

It is applicable to a wide range of crops and livestock—perishable as well as storable commodities. It does not discriminate against livestock producers by distorting prices of feeds used in livestock production. It can end the historic discrimination of supporting only a few program crops. This eliminates whatever program bias there is against a broader crop mix for farms.

It can be phased in relatively easily. The program can be started for the crops that are

relatively easy to reform first: wheat, corn, soybeans, other feed grains. Initial support levels are very close to the actual 1991–92 effective support prices for corn and wheat, and close to the market price for soybeans. Other commodities which may require special reforms can be phased in later: cotton, rice, peanuts, tobacco, sugar, and so on. As the success of early applications becomes apparent, there will be added pressures to reform other commodities—possibly livestock commodities and other commodities not traditionally supported.

The structure of U.S. agriculture has changed enough that opposition to such a plan may have dwindled as much as has support for current farm programs. We now have fewer farms, farm operator income levels closer to the non-farm sector (although more variable and with wider dispersion), and greater reliance of farm operators on off-farm income. In the public's view, the farm sector no longer needs income support transfer payments, nor supply management policies. If these policies are not severely curtailed by GATT or NAFTA agreements, they will face increasing taxpayer opposition.

Our proposed plan can turn a forced

adjustment into a real advance for all concerned. Comprehensive risk management, as proposed here, still appears to have public support. And, risk management plus forward planning prices may have appeal to a broad cross section of agriculture, including sectors which have not participated in the past.

A final note: we have not dealt with several implementation issues in this proposal because of limited space. (1) The size and boundaries of the geographical regions for the calculation of yield and price insurance; (2) the level of yield and price insurance premiums for a given yield, crop, and region; (3) the design of effective and low-cost environmental compliance provisions, and (4) the merits and methods for program payment or participation limits. We are convinced these important issues have feasible answers. ■

■ For more information

Teigen, Lloyd D. *Agricultural Parity: Historical Review and Alternative Calculations*. Econ. Res. Serv. USDA. AER 571, 1987.