Staff Papers Series

STAFF PAPER P87-34

OCTOBER 1987

THE CONSERVATION RESERVE AND SUPPLY CONTROL: IS THE BASE BITE THE BEST BET?

Steven J. Taff

Department of Agricultural and Applied Economics

University of Minnesota
Institute of Agriculture, Forestry and Home Economics
St. Paul, Minnesota 55108

STAFF PAPER P87-34 October 1987

The Conservation Reserve and Supply Control: Is the Base Bite the Best Bet?

Steven J. Taff

ABSTRACT

To examine the extent to which the Conservation Reserve Program (CRP) brings about a reduction in surplus commodity production, I develop a simple model that incorporates the farm-level production effects of entry into the Reserve. The model is used to estimate the reduction in aggregate program crop acreage under two CRP program alternatives: (1) the "base bite," which requires a proportional reduction in a farm's commodity base as a condition of CRP entry (the current law) and (2) no base bite, which for supply control purposes would rely upon a "displacement" of acreage actually available for planting. Data from the first four rounds of CRP bidding permit comparison of the supply control impacts of the alternative provisions. The base bite is shown to have reduced aggregate program crop plantings by 8.7 million acres, while displacement would have reduced plantings by 8.0 million acres.

The Conservation Reserve and Supply Control:

Is the Base Bite the Best Bet?

Steven J. Taff *

Section 1: Introduction

The Conservation Reserve Program (CRP) was an integral part of the compromise between agricultural and environmental interests in the passage of the 1985 Food Security Act. Reflecting this compromise, the CRP has two principal goals: erosion reduction and supply reduction. In this paper, I examine the supply-control facets of the program, using a simple model of cropland allocation decisions that embodies the specifics of CRP rules as presently specified.

Under the CRP, landowners agree to retire highly erodible cropland[1] for ten years in exchange for an annual payment. Farmers submit sealed bids to the USDA, indicating the total of their eligible acreage that they would enter into the Reserve and the payment per acre that they would be willing to accept annually as compensation. The USDA then announces the maximum accepted bid level (the "bid cap") for the multi-county pool in which the farm is located. All parcels bid at that rate or lower in the pool are enrolled. Through February 1987, 17.7 million acres have been enrolled nationwide.

---

*Assistant Professor and Extension Economist, Department of Agricultural and Applied Economics, University of Minnesota. This study was supported in part by the Minnesota Agricultural Experiment Station. Special thanks to Michael Linsenbigler of the Agricultural Stabilization and Conservation Service for data set support and to Wiktor Adamowicz, Ford Runge, and Athanasios Athanasenas for valuable comments.

The focus of this paper is the CRP's "base bite," a feature designed to give a conservation program some supply control impact over and above the reduction in production that might result from retiring the CRP acres themselves. For each acre entered into the Reserve, a farm's aggregate acreage base is reduced (for the period of the contract) by the ratio of the CRP land to the farm's total cropland. A farmer with more than one crop acreage base can allocate the bite against one or more of these bases.[2] In "retiring" a portion of each enrollee's base for the duration of the CRP contract, the government reduces its obligations for any payments (notably deficiency payments) tied to crop acreage bases. This reduction in payments could be balanced against the annual CRP rental payment obligated in the process, but such a balancing is not performed here. I examine only the production effects of the base bite.

If there were no base bite provision in the CRP, there might still be some associated reduction in program crop acreage. This phenomenon, which I call "displacement," results when the amount of land entered into the CRP on a particular farm is sufficiently large to reduce the amount of remaining land that could be legally planted to program crops. Could displacement ever result in more production cut-backs than those accomplished by the base bite? Yes, under conditions to be developed in this paper.

In Section 2, I show the base bite's intended effects by means of a simple algebraic representation of federal land retirement law. The model allows as well the portrayal of production under a hypothetical CRP with no base bite. In Section 3, I use the model to represent CRP-altered production levels with and without a bite. Section 4 estimates the reduction in program crop acreage brought about by CRP entries during the first four rounds of bidding. Section 5 discusses the results.

Section 2: The Model

CRP enrollment can reduce production of a particular crop in two ways. First, production will decrease if the entry reduces the amount of land that is agronomically suitable for that crop. Second, production will decrease if the CRP entry reduces the amount of land on which the crop can be legally grown. This contraction could occur through the base bite, which reduces "permitted plantings," the amount of land that can be legally allocated to crop production, or through displacement, whereby the CRP reduces the amount of land left for planting particular crops ("available acres").

The relative impacts of the base bite and displacement are critical in determining the supply control effectiveness of the CRP and lie at the heart of this analysis. To anticipate: the base bite is the superior supply-control tool on those farms on which available acres exceeds permitted plantings (no displacement) and that the opposite holds when available acres constrain permitted plantings (some displacement). I show this by a simple one-crop model, then expand it into a multi-crop framework. The model is principally a representation of federal land retirement laws; for the most part, it does not rely upon assumptions about either landowner or government behavior. It can be thought of as a particular specification of a more general supply-response model such as those developed by Lee and Helmberger (1986), among others.

Behavioral assumptions and maximizing models are unnecessary to estimate program crop production, I argue, because program crop supply and crop prices are largely untethered in the presence of government program, as Lee and Helmberger point out. Planting allocations need not be treated in an optimizing framework, because legal production constraints and incentives to maintain base mean that farmers plant all they legally and agronomically can of a program crop. Planting levels can instead be modeled using the simple formulation of the law employed here. The model draws attention to the critical nature of legal, as opposed to agronomic or financial, constraints when government supply-control programs are in effect.

Single-Crop System

Let C be the farm's total cropland, B be its single crop acreage base, R be the acreage entered into the CRP, and j and k be required set-aside and optional paid land diversion percentages, respectively.[3] Assume that the farmer makes land allocation decisions in this order: CRP first, then required ARP/PLD idling, then the commodity crop, and finally any non-program crop (if land remains). "Permitted plantings" is the legal acreage limit for the program crop, while "available acres" is the amount of land remaining after ARP, PLD, and CRP idling have been designated.

The base bite, required as a condition for CRP entry, reduces total farm acreage base by some factor β. Generally, then, permitted plantings with CRP entry is $(1-j-k)(1-\beta)B$. Under current law, $\beta=R/C$. Since setting the bite factor to zero is equivalent to removing the bite entirely, the analysis conducted here effectively compares CRP-induced planting reductions when $\beta=R/C$ (bite) with reductions if $\beta=0$ (no bite).

The farm acreage base under a base bite becomes $N\equiv(1-R/C)B$. Because $N\leq B$, permitted plantings with a bite are always less than if there were no bite. But if there were no bite, set-asides, $(j+k)B$, would be larger and, so, available acres would be smaller.

Displacement occurs when permitted plantings is constrained by available acres. It can be shown that this happens if $R>C-N$ with a bite, and if $R>C-B$ with no bite. But it also can be shown that $R>C-N$ iff $R>C$, which is impossible: displacement occurs only under a no-bite provision. The calculations necessary to determine the amount of land allocated to each use, with and without the CRP and with and without the base bite, are presented in Figure 1. In Figure 2, I show these allocations schematically.

Critical for present purposes is the possibility that on some farms displacement might even exceed the reduction in planting attributable to the base bite. This would be the case if available acres with no bite would be less than permitted plantings with a bite, a condition that reduces to

$$R > C - B + \frac{RB}{C}(1-j-k).$$

This possibility is also represented in Figure 2.

Multiple-crop system

Because farmers can allocate the base bite among any or all existing bases, the model needs to be expanded to represent more than one program crop. In Figure 3, the $i=1,\ldots,I$ subscripts denote each program crop for which a farmer may have an established base. Land utilization decisions are as before: CRP first, followed by required set-asides and optional PLDs, program crops, and other crops. Program crops are assumed to be selected in decreasing order of their net returns per acre. The total base bite is allocated over one or more of a farm's existing bases, at the farmer's option, the proportion shown by α_i, where $\Sigma\alpha_i=1.0$ for each farm. Individual bases become

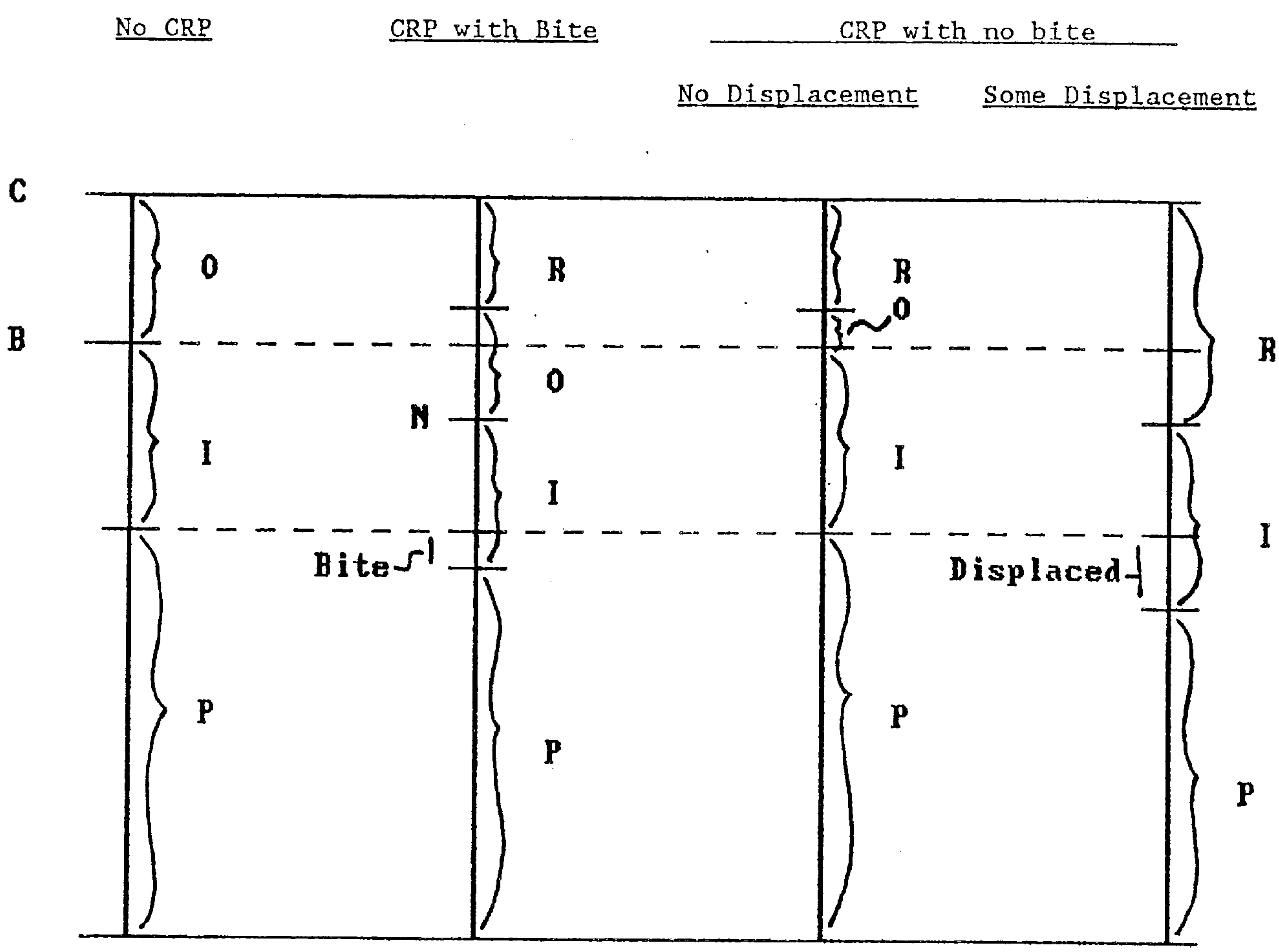
$$N_i = B_i - \alpha_i RB/C .$$

Figure 1: Available acres and Permitted Plantings--One Crop System

	No CRP	CRP with bite	CRP without bite
CRP	0	R	R
ARP/PLD	(j+k)B	(j+k)N	(j+k)B
Permitted	(1-j-k)B	(1-j-k)N	(1-j-k)B
Available	C-(j+k)B	C-R-(j+k)N	C-R-(j+k)B
Other crops	C-B	C-R-N	C-R-B

Note: $N \equiv (1-R/C)B$

Figure 2: Land allocation under base bite and no-bite provisions



KEY:

P	Planted to program crop	N	CRP-reduced base
I	Idled by ARP/PLD	R	CRP acres
C	Total cropland	O	Planted to non-program crop
B	Original base		

Figure 3: Available and Permitted Plantings--Multi-Crop System

	No CRP	CRP with bite	CRP without bite
CRP	0	R	R
ARP/PLD	$\Sigma(j_i+k_i)B_i$	$\Sigma(j_i+k_i)N_i$	$\Sigma(j_i+k_i)B_i$
Permitted	$\Sigma(1-j_i-k_i)B_i$	$\Sigma(1-j_i-k_i)N_i$	$\Sigma(1-j_i-k_i)B_i$
Available	$C-\Sigma(j_i+k_i)B_i$	$C-R-\Sigma(j_i+k_i)N_i$	$C-R-\Sigma(j_i+k_i)B_i$
Other Crops	$C-\Sigma B_i$	$C-R-\Sigma N_i$	$C-R-\Sigma B_i$ (no displacement) 0 (some displacement)

Note: $N_i \equiv B_i - \alpha_i RB/C$.

Required idling and paid diversions apply only to crops for which the farmer enrolls, and not all crops for which a farm has a base need be enrolled.

Displacement (available acres less than permitted plantings) occurs on an aggregate basis if $R>C-\Sigma B_i$ when there is no bite. (As was the case with the single-crop model, displacement can never occur under a base bite provision.[4]) Farms under a no-bite provision would plant less than they do under a bite if available acres with no-bite is less than permitted plantings with a bite. This condition reduces to

$$(1) \qquad R > C - B + \Sigma(1-j_i-k_i)\alpha_i RB/C .$$

The relative effectiveness (for supply control purposes) of displacement over the base bite, then, depends upon the aggregate impact of farms on which (1) would hold if there were no bite. The overall message of the single-crop model remains unchanged: the possibility of displacement under a no-bite provision means that the bite is not automatically the superior supply-control instrument.

Section 3: Aggregate Production

The important distinction for our purposes is aggregate production on CRP farms with an without a base bite. (Non-CRP farms are assumed to be unaffected by the program.) Under a base bite, I have shown, displacement can never occur. Total actual plantings under a base bite is simply the aggregate of permitted plantings:

$$(2) \qquad \sum^{XI}\Sigma(1-j_i-k_i)N_{ix} ,$$

where X is the set of CRP enrollees. Without a base bite, total plantings (where Q and S are the sets of farms on which displacement does not or does occur, respectively) would be the sum of aggregate plantings for constrained and unconstrained farms:

$$(3) \quad \sum^{Q}\sum^{I}(1-j_i-k_i)N_{iq} + \sum^{S}[C_s - R_s - \sum^{I}(j_i+k_i)B_{is}].$$

Total plantings with the bite is less than total plantings without the bite if (2) < (3). The extent to which this holds would have to be determined empirically: there is no a priori justification for either the base bite or displacement as the better supply control tool. Unfortunately, available data do not permit a direct comparison of the two planting levels. A more indirect comparison is possible, however, as I show in the next section.

Section 4: The Evidence

Which provision, then, would be the better supply controller? I present here evidence from the first four CRP rounds (through February 1987), in which over 152,000 contracts covering over 17 million acres were signed. The two provisions' actual and hypothetical effects on aggregate program crop production are measured by estimating reductions in permitted plantings under each. The procedure is consistently biased in favor of the base bite provision. I assume the same "slippage"--a less than one-to-one link between a retired acre and the associated reduction in production--regardless of the presence or absence of the base bite. I also assume that the distribution of idled acres across crops will be the same for equivalent acreage reductions. Finally, I ignore altered production levels attributable to varying land quality or market effects.

(See Boggess; Hertel and Preckel; Dicks, et al.; and Webb, et al. for other approaches.)

The data set is the official ASCS listing of all CRP contracts signed to date. Each record summarizes an individual contract, with associated payments, base reduction, and required conservation practice information. Farmers can allocate the base bite among any or all of their bases, but the data set permits determination only of the aggregate farm acreage base. Additionally, the data report only those bases actually selected for biting, not all bases on the farm. If no bite happens to be allocated to a particular crop, it might be the case that the farmer chose not to bite that crop's base or it might be the case that the farm has no base in that crop. The data do not permit this distinction.

Figure 4 shows the distribution of base bite allocations among crops for all 142,852 farms that were subject to the base bite. (Seven percent of the CRP contracts were on farms that have no base to bite. These farms are not subject to legal planting constraints of the type considered here.) The numbers in the last column treat the whole set of CRP participants as if it were one farm. One can think of these as the diminution in each commodity's base that each additional CRP acre brings with it.

The data do not permit calculation of available acres or of permitted plantings by crop, because the individual crop acreage bases B_i cannot be determined. Consequently, we cannot make the direct comparison of the relative magnitudes of plantings required in (3). We can, however, determine the required reduction in plantings under the alternate provisions, as I show now.

Figure 4: Distribution of base bites by crop: U.S.; through February 1987

Crop	Number of CRP contracts biting at least this crop base	Total Reduction in base (acres)	Proportion of bite assigned to crop
Corn	69,469	2,320,179	.20
Wheat	72,801	5,110,445	.45
Oats	34,370	553,891	.05
Barley	19,524	1,301,026	.11
Sorghum	30,417	1,404,801	.12
ELS cotton	18	514	(negl.)
Rice	82	2,884	(negl.)
Upland cotton	7,453	751,286	.07
Tobacco	590	3,060	(negl.)
Peanuts	179	11,044	(negl.)
Total Base Bite		11,459,129	

SOURCE: Author's calculations from USDA ASCS data.

In Figure 5, the reduction in permitted plantings attributable to the base bite, $(1-j_i)\alpha_i BR/C$, as in Figure 5. (Only required set-asides are calculated, since the optional paid diversions are not reported in the available data. This has the effect of overstating supply reduction through the base bite). Because permitted plantings are subject to set-aside requirements, a one acre reduction (by the base bite) in a crop's base leads to a less than one acre reduction in that crop's production.

Under a no-bite system, 78,650 (51%) of the enrollees would be subject to displacement (Figure 6). The critical comparison is the difference between acreage reductions attributable to the base bite and those which would be brought about by displacement. (As discussed above, only those farms on which (1) holds would plant less under a no-bite provision. This is a subset of the farms on which displacement would occur.) In Figure 7, I subtract, respectively, permitted plantings with a bite and available acres with no bite from permitted plantings with no CRP at all. This reduces to

$$(4) \quad \sum^{X}\sum^{I}[(1-j_i-k_i)\alpha_{ix}B_xR_x/C_x] - \sum^{S}[\sum^{I}B_{is}-C_s+R_s].$$

If (4) is positive, the base bite is the preferable provision for supply control. If negative, no-bite is better. This relationship is fully determinable with available data.

Figure 8 traces the actual reduction in permitted plantings and the hypothetical reduction which would be accomplished by displacement over the first four rounds of CRP enrollment. Aside from the first round, displacement ran from 89-98% of the base-bite reduction. The cumulative

Figure 5: Annual planting reductions due to CRP base-bite: U.S., through February 1987

Crop	Required Reduction (percent)	Reduction in permitted plantings (acres)
Corn	20	1,856,143
Wheat	27.5	3,705,073
Oats	20	443,113
Barley	20	1,040,821
Sorghum	20	1,123,841
ELS Cotton	15	437
Rice	35	1,875
Upland Cotton	25	563,464
TOTAL		8,734,767

Note: Tobacco and peanut bases are also eligible for the CRP bite, but these crops operate under allotment programs rather than required set-asides, so production effects can't be traced. These two crops account for 0.1% of the base bite achieved in the first four rounds on CRP enrollment.

SOURCE: Author's calculations from USDA ASCS data.

Figure 6: Distribution of CRP contracts by constraint and provision: U.S., through February 1987.

	Provision			
	Bite		No Bite	
No Displacement	142,852	(X)	64,202	(Q)
Some Displacement	0	(Y)	78,650	(S)

Note: 10,084 farms with no base are excluded from this analysis.

SOURCE: Author's calculations from USDA ASCS data.

Figure 7: Reduction in plantings due to CRP

	Provision	
	Bite	No Bite
No Displacement	$\sum^{X}\sum^{I}(1-j_i-k_i)\alpha_{ix}R_xB_x/C_x$	0
Some Displacement	n/a	$\sum^{S}[\sum^{I}B_{is}-C_s+R_s]$

reduction shows 8.7 million acres to the base bite and 8.0 million acres to displacement. Consequently, (4) is positive: a CRP with a base bite has been slightly superior to a no-bite CRP--with respect to supply reduction.

Section 5: Discussion

The analysis is biased in favor of the base bite in two ways.[5] First, by not including the paid land diversion factor k_i, I overstate the reduction in permitted plantings attributable to the bite. Second, by holding enrolled acres per farm R_s fixed under the hypothetical no-bite provision, I may understate the supply reduction attributable to displacement. I here elaborate on the second point.

Would a participating farm be likely to put even more land into the Reserve in the absence of a base bite? Consider the simple net returns function

$$NR = (1-j-k)\pi_m(1-R/C)B + pR + \pi_a(C-R-(1-R/C)B),$$

where p is the CRP rental payment and π_m, π_a are per-acre net returns from commodity crops and non-program crops, respectively. All other symbols are as before. The incremental opportunity cost of CRP entry, $\partial NR/\partial R$, is

$$p^* = (1-j-k)(B/C)\pi_m + \pi_a(1-B/C).$$

If there were no base bite, the opportunity cost of CRP entry would be simply the return from the non-program crop, π_a, up to the level (C-B), where displacement would kick in. After that, each CRP acre would cost the foregone program crop income, $(1-j-k)\pi_m$. So <u>total</u> opportunity

Figure 8: Total reduction in plantings (acres) compared to no CRP: U.S., through February 1987.

	Reduction in Plantings (acres)	
Round	Base Bite	Displacement
1	338,863	227,058
2	1,345,235	1,220,334
3	2,432,887	3,376,148
4	4,617,781	4,115,591
	8,734,767	7,989,131

SOURCE: Author's calculations from USDA ASCS data.

cost of R acres with a bite would be greater than total opportunity cost with no bite if

$$p^{*}R - \{(C-B)\pi_a + (1-j-k)\pi_m(R-(C-B))\} > 0.$$

This holds for all

$$\pi_m(1-j-k) > \pi_a.$$

Since (j+k) ranges from 0.20 to 0.35 for program crops under current law, the base bite is more expensive to the farmer if non-program crops return less than 65-80% of the net returns of program crops. Whenever this holds, removal of the base bite would reduce the opportunity cost of CRP entry for the farmer and so, presumably, increase the number of acres entered.

But why wouldn't a farmer have put all eligible land into the CRP in the first place? In a single-crop framework, all eligible land will be entered if $p > p^{*}$, and removal of the base bite would not (could not) stimulate additional entry <u>on that farm</u>. In a multi-crop framework, however, p might be large enough to entice entry to a level sufficient to remove (through the base bite) one crop's base and yet not large enough to entice total entry, because $p < p_j^{*}$ for some other program crop. In this instance, removal of the base bite might reduce the opportunity cost of entry to some p_i', such that $p_j^{*} > p > p_i'$. Again, removal of the bite in this instance would increase the level of entry for participating farmers and, hence, increase the displacement of program crop acreage as well.

<u>Section 6., Conclusion</u>

The base bite (as presently specified under law) has been shown to be marginally superior to displacement, with respect to supply control. A larger bite (some β>R/C) would increase its relative effectiveness. A logical next item on the research agenda is to examine the dollar cost of the bite. Federal commodity program expenditure reduction was an implicit goal of the CRP in general and the base bite in particular. If there were no bite, farmers could probably, because of lower opportunity costs, bid less than they do now. The per-acre cost of the Reserve could be lower (if a true bidding system is maintained), and supply reduction (if the bite remains at present levels) would be roughly the same. However, under a no-bite CRP, the government could not require in exchange some of the farm's base. As a result, price-support payments would not be lowered as they are under the present CRP. (Although in the long run they might decline as displacement reduces historic plantings. See Note 5.) In addition, if either the base bite or displacement succeed in significantly lowering program crop production, then associated market price increases could reduce government budget exposure by lowering required per-bushel deficiency payments. The net effect of such adjustments is worthy of exploration.

NOTES

[1]CRP eligibility is restricted to currently cropped lands that are: (a) in SCS capability classes VI-VIII, (b) class II-V lands that are eroding at more than three times the SCS-determined tolerance rate ("3-T" or greater), (c) lands that exhibit severe gullying and are eroding at 2T or more, or (d) lands with an Erodibility Index of 8 or more that are eroding at a rate greater than 1T.

[2]A farm's official crop acreage base is a number (linked to historic planting records) used by ASCS to determine the magnitude of the deficiency payments for that commodity. The base is an accounting entity, not a geographical designation; hence, a particular acre should not be thought of as a "base acre" or a "non-base acre." Deficiency payments are calculated for output "grown" on the farm's established base at the established base yield. The farmer can plant no more of a program crop than its permitted acreage, which is the established base in that crop, less any set-aside or PLD.

[3]The 1985 Food Security Act provides three instruments to control supply--acreage limitations, set-asides, and required diversions. All three, often used interchangeably in the literature, require that the farmer not plant some cropland, in exchange for government subsidies. A "set-aside program" would require that the farmer not plant a particular proportion of "planted acres." An "acreage limitation program" would require that the farmer not plant a particular proportion of the crop acreage base. "Required diversions" are additional to the other two and might be tied either to base or to planted acres. In implementing the bill, the USDA selected an acreage limitation program with a small

required diversion tied to base. An optional paid land diversion for feed grains was added in 1987. The distinctions are important to the extent that the base, which is the average of several years of planted and considered-planted acres, differs from planted acres, which is a one-year record only. In this paper, I follow the convention of referring to the present acreage limitation plus required diversion programs as "ARP" and the optional paid land diversion as "PLD."

[4]Although displacement of total program crop acreage can never occur under a base bite, the available acres constraint could hold for a single crop's planting levels. Consider the specific example of the effect of the base bite on a farm which has a corn base, among others. Assume that corn is the most lucrative crop and so will be planted up to legal limits whenever possible. The difference between corn planting levels with and without the bite is dependent upon α_c, the proportion of the bite allocated to the corn base. The lower is α_c, the closer is N_c to B_c and the more equal (for corn supply control purposes) are the two provisions. With the base bite, total available acres would constrain permitted corn plantings if

$$(1-j_c-k_c)(B_c-\alpha_c BR/C) > C - R - \Sigma(j_i+k_i)(B_i-\alpha_i BR/C).$$

This reduces to

$$R > C - N_c - \sum_{i\neq c}^{I}(j_i+k_i)N_i$$

But if this constraint on corn plantings happens to hold, it must follow that no other program crops will be grown, because the farmer (by assumption) plants as much corn (the most lucrative crop) as is legally allowed. Set-asides (and plantings) for non-corn program crops will therefore be unnecessary. As a result, the physical constraint on corn holds only if $R>C-N_c$ with a base bite and, by similar reasoning, if $R>C-B_c$ with no bite. It can be shown that the $R>C-N_c$ constraint holds if

$$R > C \left[\frac{C-B_c}{C-\alpha_c B_c} \right],$$

which is possible for $0<\alpha_c<1$. It could be the case, therefore, that displacement of a particular crop occurs under a base bite, even though this would never hold for aggregate production.

[5]The bite may be favored in yet another way. A farm's base can be thought of as a "right" to government payments when market prices are low. In a dynamic context, farmers may wish to preserve base in order to maintain marketing flexibility, to spread risk. The base bite then carries with it an implicit increase in risk exposure, because it reduces flexibility. Presumably, this increase in risk adds to the opportunity cost of CRP entry, and removal of the bite would lower opportunity costs and increase CRP entry. One might counter that displacement also can increase risk in a same dynamic context. If farmers don't plant a particular program crop over a period of years, they run the risk of lowering their "historic plantings" for that crop. By traditional USDA rules this could lower the established base and, by the preceding arguments, increase the risk faced by the farmer.

Which risk premium is the higher, that caused by the base bite or that caused by displacement, is a measurement not undertaken here.

SOURCES

Boggess, William G., "Implementing the Conservation Reserve Provisions: Potential Risks Facing Farmers." Paper presented at the 1986 Meeting of S-180 "An Economic Analysis of Risk Management Strategies for Agricultural Production Firms," Tampa, Florida, March 1986.

Dicks, Michael R., Katherine Reichelderfer and William Boggess. "Implementing the Conservation Reserve Program." ERS Report No. AGES 861213. USDA: Washington, D.C., January 1987.

Hertel, Thomas W. and Paul V. Preckel. "Commodity-Specific Effects of the Conservation Reserve Program: A Summary Function Approach." Paper presented at the 1987 Meeting of NCR-111, "The Conservation Title in the 1985 Food Security Act: What have we learned?", St. Louis, MO, June 1987.

Lee, David R. and Peter G. Helmberger. "Estimating Supply Response in the Presence of Farm Programs." Amer. J. Agr. Econ. 67(1985):193-203.

Webb, Shwu-Eng H., Clayton W. Ogg, and Wen-Yuan Huang. "Idling Erodible Cropland: Impacts on Production, Prices, and Government Costs." ERS Agricultural Economic Report No. 550. USDA: Washington, D.C., April 1986.