Competition for Land Between Program and Fruit and Vegetable Crops[13]

To put bounds on possible land use shifts if planting restrictions were relaxed, we identify where various crops can be grown and where current base acreage constraints may be restricting production of wild rice, fruit, and vegetables. According to the census of agriculture, about 434 million acres of cropland were available in 2002, of which about 12.5 million acres were used to produce fruit and vegetables. USDA's Farm Service Agency (FSA) indicates that 266 million acres of cropland were designated as base acreage in 2003 and 35 million acres of cropland were enrolled in the Conservation Reserve Program and not available for annual crop production.[14] From this information, one might conclude that current planting restrictions are not binding and that sufficient land is available to increase production of fruit and vegetables.

Where Is Fruit and Vegetable Production Limited?

We plotted the geographical intersection of crop production and base acreage by using a series of maps to illustrate where planting restrictions might be significant and which commodities might be affected. An advantage of maps is that they convey some of the variation in land use (and land constraints) across regions.

The first map shows base acreage as a share of total cropland, minus land enrolled in long-term retirement programs (fig. 7).[15] The map shows the relative importance of base acreage in various regions. Base acreage comprises a particularly large share of cropland in the Corn Belt, northern Plains, Mississippi Delta, and parts of the Southeastern States. While a much smaller share of available cropland, base acreage is important in California, the most important fruit- and vegetable-producing State. Very little cropland in Florida, the second leading fruit- and vegetable-producing State, is designated as base acreage.

The second map shows fruit and vegetable area as a share of nonbase cropland (fig. 8). The map highlights areas where further expansion of fruit and vegetables may be limited either by lack of total land or by planting restrictions on base acreage. Eastern North Dakota, a region where dry beans and potatoes are grown, shows up as a region where base acreage constraints may be limiting fruit and vegetable production. Land constraints also show up in southern Minnesota, central Wisconsin, northern Illinois, western Michigan, and western New York, where a variety of processing fruit and vegetables are grown. In California and Florida, fruit and vegetables already account for a large share of cropland. Other areas to note include parts of the eastern coastal plain, southern Idaho, and central Washington. While fruit and vegetable acreage is high in these areas, many counties in these regions have more than 100,000 acres of additional nonbase land available for crop production.

An alternative to looking at current land constraints is to look at potential changes in land availability after a policy change. Figure 9 illustrates a shift in land availability for fruit and vegetable crops and compares the relative availability of land with planting restrictions in place and the availability if

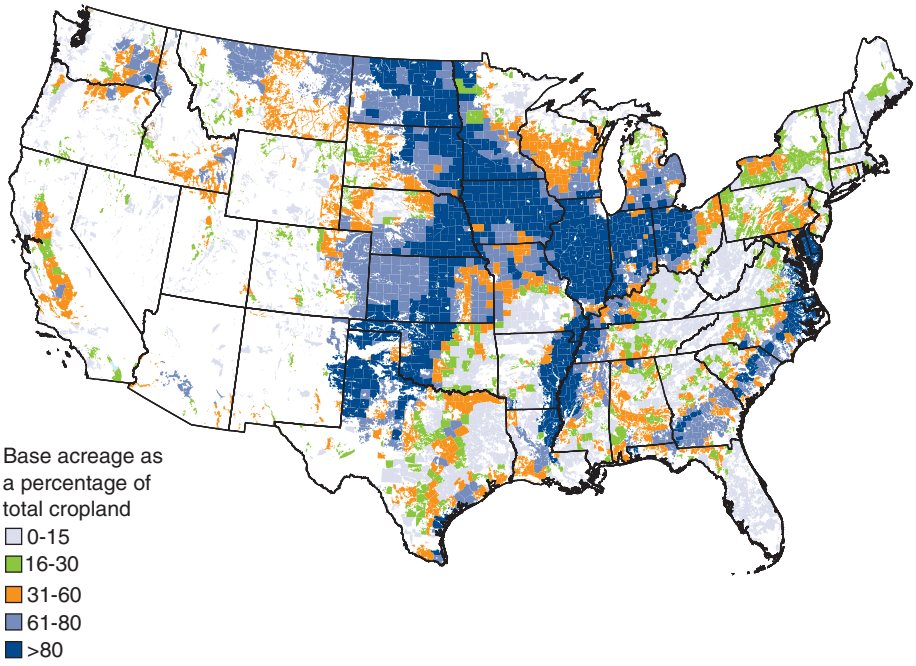
[13]This section draws on data from the Census Bureau and from USDA's Farm Service Agency. These data sources are not totally compatible. Farm program data are collected for farms based on ownership. Thus, an operating farm that leases land might consist of several FSA farms. In addition, an FSA farm might extend across county boundaries, which can affect any analysis done using county-level data.

[14]Farm program data for 2003 are used for comparison in this analysis because 2002 was a transition year for farm programs. For 2002 contracts only, fruit, vegetables, and wild rice could be planted on base acreage and not violate the contract or result in reduced direct and countercyclical payments.

[15]Land enrolled in the Conservation and Wetland Reserve programs is generally unavailable for annual crop production.

Figure 7

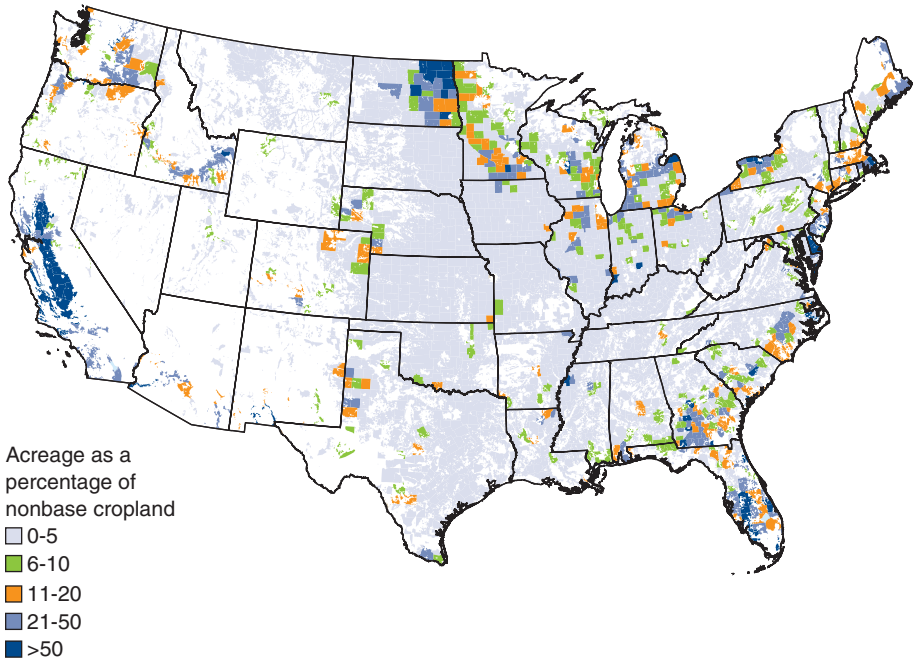
Higher shares of total cropland designated as base acreage indicate where land may be constrained



Source: Compiled by the Economic Research Service, USDA, from Farm Service Agency, USDA, data.

Figure 8

Fruit and vegetable area planted comprises a large share of nonbase cropland in some regions



Source: Compiled by the Economic Research Service, USDA, from Farm Service Agency, USDA, data.

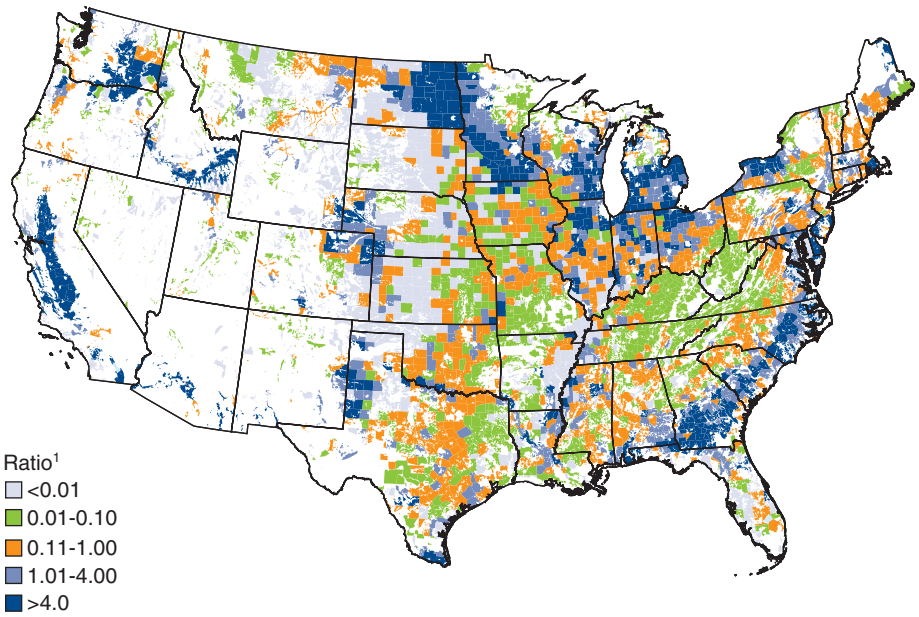
they were lifted.[16] Darker shades indicate regions where the relative availability of land for fruit and vegetables could change the most. Eastern North Dakota, Minnesota, Wisconsin, Michigan, and California are areas where the change could be most significant.

The maps help us identify areas where planting restrictions may limit fruit and vegetable production (figs. 7-9). However, they do not identify the specific commodities likely to be affected by relaxed planting restrictions. To identify the particular fruit and vegetables limited by base acreage, we computed base acreage as a share of cropland in States producing selected fruits and vegetables, weighted by State shares of planted acreage (fig. 10). This measure indicates that planting restrictions are most important for dry beans, processing vegetables, and potatoes. About 30 percent of cropland in regions that produce citrus crops is base acreage compared with 70 percent in regions that produce dry beans.

Where Are Farms That Produce Both Fruit and Vegetables and Program Crops?

The preceding discussion illustrates the overlap in regions where program and fruit and vegetable crops are produced. In fact, many producers frequently grow multiple commodities on their farms, including fruit and vegetables as well as program commodities. To evaluate the overlap between program crops and fruit and vegetable production, we look at FSA "certified" acreage. Farmers who participate in the direct and countercyclical payment

Figure 9
Impact of eliminating planting restrictions on the relative availability of land for fruit and vegetables



[1]Ratio of fruit and vegetable acreage to nonbase acreage minus the ratio of fruit and vegetable acreage to total cropland.

Source: Compiled by the Economic Research Service, USDA, from the Farm Service Agency, USDA, data.

[16]The variable being mapped (by county) is the difference between two ratios: (RC / NB) - (RC / TA), where RC denotes acreage planted to fruit and vegetables, NB denotes nonbase acreage, and TA denotes total available acreage. The first ratio measures relative availability of land with planting restrictions in place; the second shows relative availability when restrictions are lifted.

programs must annually report or "certify" the use of land on their farms. We used State-level summaries of these acreage reports and program enrollment data for 2003.

These producers presumably could expand production of fruit and vegetables if the planting restrictions were eliminated. Many farms currently produce or have a history of producing fruit and vegetables on base acreage. Farm landowners could have established a history of producing fruit and vegetables in 2002 when oilseeds were added to the list of program crops, even if they did not plant fruit and vegetables on base acreage. For example, consider a farm with 100 corn base acres and 50 other acres. This farm planted 80 acres of corn, 50 acres of soybeans, and 20 acres of fruit and vegetables in 1998-2001. When designating base acres in 2002/03, the landowner likely would have designated 100 acres as the corn base and 50 acres as the soybean base. By designating all of its acreage as base, the farm would have established a history of planting fruit and vegetables on base acreage.

Farms that certified acreage planted about 2 percent of their cropland, over 6.5 million acres, to fruit and vegetables in 2003 (excluding lentils, dry peas, and mung beans) (table 4).[17] Thus, about one-half of land devoted to fruit and vegetables is on farms that certify acreage with FSA.[18] As noted previously, farmers are less likely to plant fruit trees and vines on base acreage than they are to plant vegetables and melons because trees and vines require several years to mature, thus delaying harvest. Less than one-quarter of the land devoted to production of fruit, nuts, and berries is on farms with certified acreage.

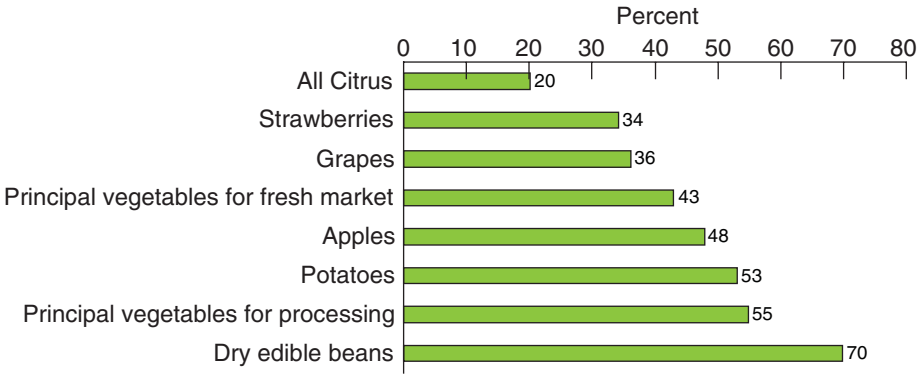
Farms that certify acreage with FSA account for most vegetable production and for 80 percent of land planted to vegetables, dry beans, and potatoes. Four commodities (sweet corn, tomatoes, dry beans, and potatoes) make up most of this acreage. Relaxing planting restrictions could result in greater production of these four commodities on land-constrained farms because many of them have produced these commodities.

Fruit and vegetable production is concentrated due to agronomic constraints; 10 States, each with over 200,000 acres of fruit and vegetables on farms

[17]We assume that almost all farms that certify their cropland use to FSA do so because they have base acreage. We acknowledge that a small proportion of the fruit and vegetable acreage on these farms may not be on farms with base acreage.

[18]County-level data are used for this analysis. Thus, a farm that produces fruit and vegetables could have a small share of the base acreage in the county.

Figure 10
Share of base acreage in areas producing selected fruit and vegetables



Source: Compiled by the Economic Research Service, USDA, from data from the Farm Service Agency and the National Agricultural Statistics Service, both USDA.

with certified acreage, account for 70 percent of area devoted to producing fruit and vegetables (fig. 4). California accounts for over one-half of the area devoted to fruit, nuts, and berries and is the leading State in tomato production, with about 85 percent of tomato acreage on farms with certified acreage. North Dakota, with almost 500,000 acres of dry edible beans on farms with certified acreage, is the leading State for dry beans.

Is Forgoing Direct and Countercyclical Payments Worthwhile?

The 80 percent of potato, dry bean, and other vegetable production on farms with program acreage clearly shows that many producers with base acreage have experience in producing fruit and vegetables and could increase production if planting restrictions were removed. Farmers who forfeited payments or violated program rules already have strong market incentives to produce fruit or vegetables.[19] In fact, many producers with a history of producing fruit and vegetables have assessed the benefits and costs of planting fruit and vegetables on base acreage and have elected to forgo payments and to plant fruit and vegetables. In 2004, producers gave up nearly $14 million in direct and countercyclical payments on 630,000 acres in order to plant fruit

[19]In addition, as noted previously, a farmer can lease nonbase cropland and reconstitute his/her farm in order to plant fruit and vegetables.

Table 4
Cropland use: Certified acreage compared with total cropland, 2003

Item	Land use on farms that certify acreage[1]	U. S. total
	1,000 acres	
Wheat, feed grains, rice, upland cotton, oilseeds, and peanuts	255,914	255,914[1]
Fruit and vegetable crops:		
Dry beans	1,177	1,406[2]
Potatoes, all	1,246	1,368[2]
Other vegetables and melons—	2,842	3,755[3]
Sweet corn	540	710[2]
Tomatoes	320	436[2]
Other beans	443	348[2]
Miscellaneous vegetables	1,582	2,261[3]
Wild rice	43	38[3]
Fruit, nuts, and berries	1,253	5,536[3]
All restricted crops	6,562	12,103
Other principal crops, including lentils, dry peas, and mung beans, but excluding hay	5,761	5,747[2]
Other cropland (includes miscellaneous crops, forage, nursery, and greenhouse, idle; excludes Conservation Reserve Program)	63,101	126,437[4]
Total cropland	331,324	400,201[3]
Base acres	266,196	266,196[1]

[1]Source: Farm Service Agency, USDA.
[2]Source: National Agricultural Statistics Service, USDA, Quick Stats, 2003.
[3]Source: National Agricultural Statistics Service, USDA, Census of Agriculture, 2002.
[4]Includes 63 million acres of hay and forage.

and vegetables (table 2). Thus, a large share of fruit and vegetable acreage, almost 10 percent of the 6.6 million acres of vegetable production on farms with certified acreage (table 4), is on base acres.

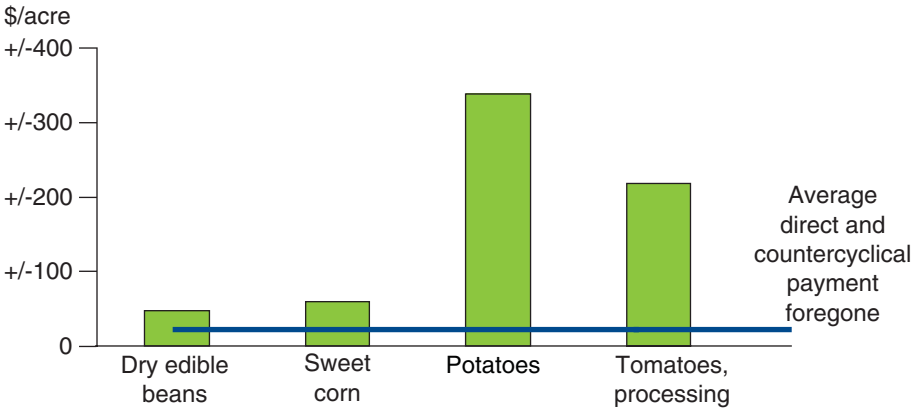
The per acre value of producing fruit and vegetables exceeds the per acre value (including direct payments) of producing competing program crops (figs. 5 and 6).[20] Higher production costs and greater risk are two reasons that producers may choose not to plant additional acreage to fruit and vegetables. The average variation in revenue for dry beans, sweet corn, potatoes, and processing tomatoes ranges from a low of about $46 per acre for dry beans to a high of $338 per acre for potatoes (fig. 11). In deciding whether or not to forgo payments on base acreage, producers with a history of planting fruit and vegetables compare fixed payments to differences in market revenue, which are highly variable across crops. In 2003, however, many producers with a history of producing fruit and vegetables concluded that giving up payments that averaged $22 per acre in order to plant fruit and vegetables on base acreage made economic sense.

California, with some of the most valuable base acreage, provides an interesting example of acreage shifts into production of a high-valued crop (fig. 1). Land devoted to almond groves has sharply increased over the last decade, and some of the rise has been at the expense of cotton base acreage. Cotton has some of the highest per acre value of payments. The United States has been the world's leading almond producer since 1977, contributing one-half of total output—nearly all produced in California's San Joaquin and Sacramento Valleys. Both domestic and export demand have been rising, with export value exceeding $1.6 billion. With recent high prices, the prospective returns for almonds—a crop that takes years to bear fruit—are such that some cotton farmers have been willing to give up their direct and countercyclical payments.[21] The value of expected net revenue from almond production exceeds the expected revenue plus government payments for cotton. While base acreage constraints could impede land-use shifts into almond production, they are not preventing the switch.

[20]While the per acre value of rice and cotton, including payments, exceeds the value per acre of processing sweet corn and dry beans, sweet corn and dry beans generally do not compete for land with rice and cotton because of regional and agronomic conditions.

[21]As reported by Schuster, one farmer claims that he can make $2,000 more per acre with almonds than with cotton.

Figure 11
Standard deviation in revenue per acre compared with average direct and countercyclical payments



Source: Compiled by the Economic Research Service, USDA, from data from the Farm Service Agency and the National Agricultural Statistics Service, both USDA.