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# Intelligence Memorandum

*Brazil's Soybeans: An Emerging Threat to US Exports*

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### Brazil's Soybeans: An Emerging Threat to US Exports

The United States continues to dominate the soybean market, but Brazil's output and exports have been skyrocketing. Prospects are for a further rapid rise in Brazilian sales, partly at the expense of US soybean exports. Soybeans make up 22% of total US agricultural exports and about 4% of total US exports; they have been the most dynamic major US agricultural export.

- Brazil's share of world exports has jumped from 3% to 13% since 1968.
- The US share slipped from 92% to 86%.
- Brazil is expected to capture nearly 20% of the market this year.

Brazilian soybean exports have not yet cut into US sales volume, but they threaten future gains. Both the United States and Brazil have benefited from an extraordinary spurt in world demand that has boosted current soybean prices to a record high. US soybean exports could exceed US \$3 billion in 1973, up from \$2.1 billion last year. Because of the record current harvest and continuing high prices, Brazil's soybean exports in 1973 could reach \$725 million – considerably more than double last year's. But prices should fall by the end of the year: the United States also expects a bumper harvest this fall, and Peru's fishmeal supplies – a close substitute in livestock feed – should partly recover by then.

Brazil is almost certain to gain a larger share of world soybean exports in the long run, especially if its competition pushes the price below the historic norm of a little more than twice that of corn. At lower prices, some US farmers would switch land to other crops such as corn, but Brazilian farmers probably would continue to find soybeans most profitable.

- At a minimum, Brazil will have 25% of the world market by 1980, which could hold US earnings to about \$3 billion if prices have returned to their average of the late 1960s.
- At a maximum, if it meets its 1980 output goal, Brazil could supply about half the world market, reducing US soybean earnings to only about \$2 billion under the same price assumptions.

Note: Comments and queries regarding this publication are welcomed. They may be directed to

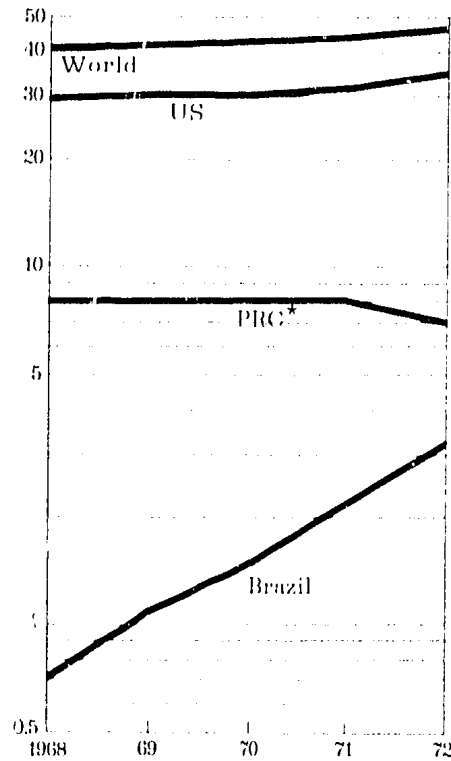
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## DISCUSSION

## The World Soybean Market

1. Three countries—the United States, the People's Republic of China, and Brazil—account for almost 95% of the world's soybean production. World output, which has grown about 1½ million metric tons annually since 1968, now stands at about 48 million tons. The United States and Brazil have provided all of the recent growth (see Figure 1). Chinese output has declined and now is an insignificant factor in the world market. At the other extreme, Brazil has been expanding its production about 50% annually in recent years and now is the United States' only important competitor. Although Brazil still accounted for only about 7% of world output in 1972, it has provided virtually all of the growth in world exports since US surplus stocks were sold off in 1970 (see Figure 2). Brazil's market share increased from only 3% in 1968 to 13% in 1972, while the US share dropped from 92% to 86%.

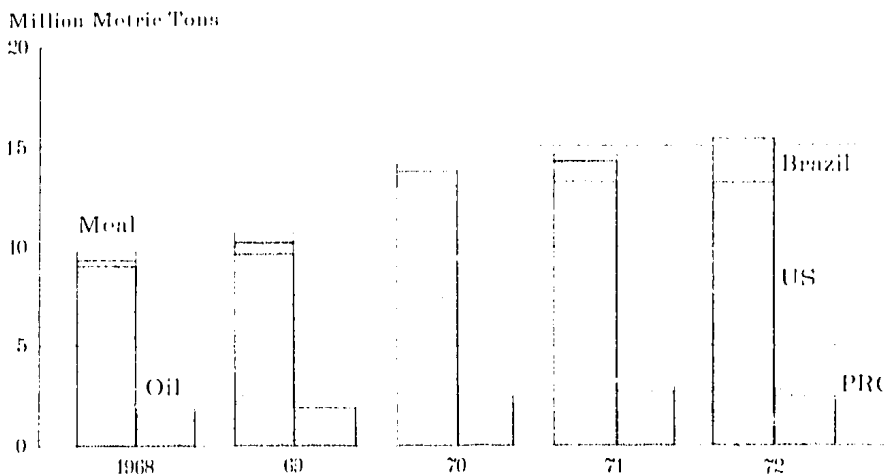
Figure 1  
**World Soybean Output**  
Million Metric Tons



2. World demand for soybeans in recent years has been largely a function of rapidly rising consumption of soybean meal as animal feed, even though human consumption of soybeans and oil also has continued to rise. Western Europe, especially the European Community countries, and Japan have been the major importers. The soybean crushing process normally yields about 79% meal and 17% oil, a much higher meal ratio than that of other oilseeds. Soybeans have been supplying an increasingly large share of the world's market for high-protein animal feed, competing with other oilseeds and fishmeal. Import demand for high-protein meal of all types has been rising by about 2 million tons a year because of worldwide efforts to expand livestock production. As foreign income levels and meat consumption increase, demand for these meals grows even faster because of increased reliance on feedlot operations as the quickest—and sometimes the only—way to boost meat production.

Figure 2

**World Net Exports of Soybean Meal and Oil\***



\*Including meal and oil content of beans exported.

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3. After several years of excess supply, the soybean market tightened and prices skyrocketed in late 1972 and early 1973. Two factors have been mainly responsible for the spurt in demand in recent months. When Peru's anchovy catch failed in mid-1972, almost two-thirds of the world's fishmeal supply was affected.<sup>1</sup> Because fishmeal is even richer in protein, each ton of fishmeal lost increased soybean demand by 1½ tons. Subsequent large Soviet purchases of grain and soybeans further intensified price pressures. In the face of this extraordinary demand, exportable soybean supplies increased little. Although harvests in both the United States and Brazil hit new highs in 1972, carryover stocks had fallen to very low levels by the beginning of the marketing year (see Figure 3). As a result, soybean prices per bushel soared from the \$2.70 average of the late 1960s to \$3.80 in mid-December and then to record highs averaging about \$6.25 during the last few weeks (see Figure 4).

**Factors Underlying Brazil's Soaring Output**

4. The Brazilian government has been actively encouraging soybean production for several years. It has carried out an intensive publicity campaign in rural areas emphasizing the advantages of soybeans over other products. State governments are also pushing soybeans: Rio Grande do Sul, for example, is sponsoring a campaign for "3 million tons in 1973," a 50% boost in state output. These campaigns have been backed up with technical

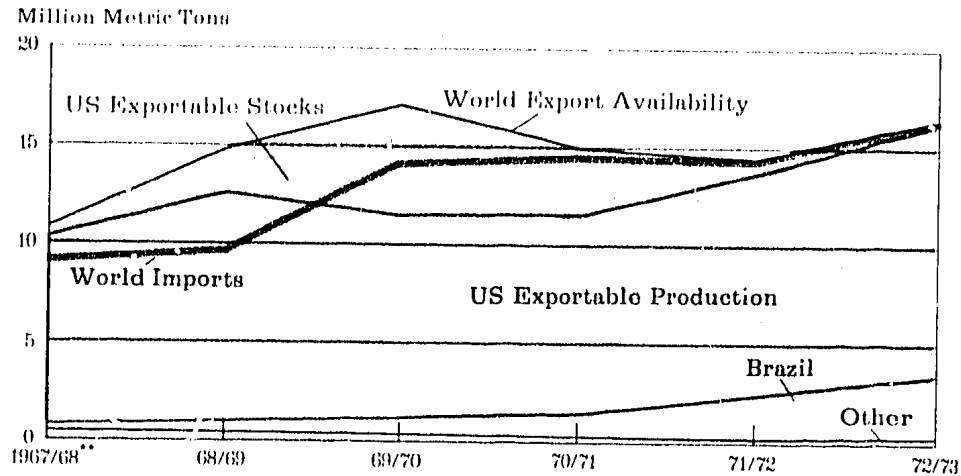


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Figure 3

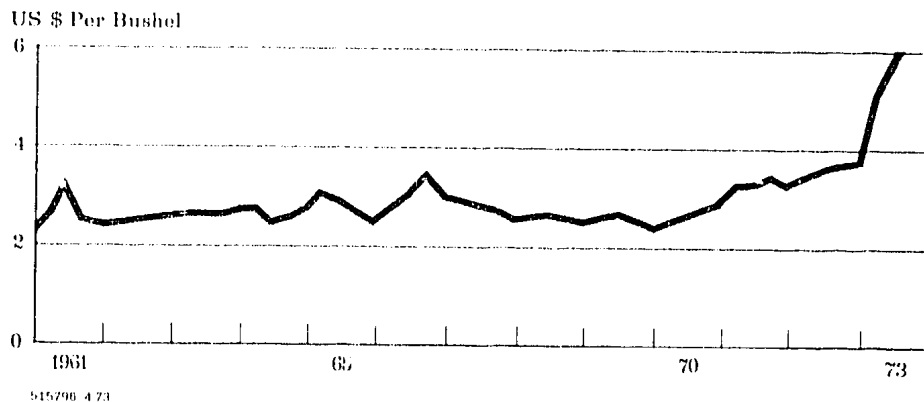
### World Export Availability and World Imports of Soybean Meal\*



\*Including meal content of beans exports.  
 \*\*Market year (October-30 September).

Figure 4

### Soybean Prices



assistance and price supports guaranteeing farmers a profitable market for their output. Brazil has raised the support price several times over the past few years, mainly to insure adequate credit to soybean farmers from lenders who use the support price to value collateral. Because the market price thus far has exceeded the support price, the government has not been called upon to buy soybeans.

5. Brazil's earlier coffee diversification program and longstanding export incentives also greatly aided soybean production. During the late 1960s, a portion of coffee export taxes went into a fund to finance coffee growers' transition to other crops. In most of the important coffee areas,

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soybeans were the most attractive alternative. Although this program has since been terminated, it was important in popularizing soybeans among Brazil's most market-oriented farmers. The government also grants tax and credit incentives to foster domestic bean crushing, thus increasing the value added to soybean exports. Until 1972, Brazil crushed nearly all of its soybeans, consumed the oil domestically, and exported mostly soybean meal. Last year's soybean output outpaced both domestic crushing capacity and vegetable oil requirements, however, and Brazil exported a million tons of soybeans and about 50,000 tons of oil in addition to 1.3 million tons of soybean meal.

6. High producer profits have, of course, been the major impetus behind the continuing rapid growth of soybean output. Brazilian soybean producers usually receive about \$0.30 a bushel less than their US counterparts because of a substantial transport cost disadvantage.<sup>2</sup> Nonetheless, because production costs are considerably below US levels, soybean production would be profitable even if world prices were to fall to the current support price—\$5 per 60-kilogram bag, or about \$2.25 per bushel. At prevailing market prices, Brazilian soybean farmers are enjoying a bonanza.

7. Soybeans are highly profitable compared with other Brazilian annual crops. Soil, climate, and well-adapted seed varieties make Brazil much more efficient in producing soybeans than any other annual crop. Brazil's average soybean output per acre in 1972 was only about 20% less than the US yield, while corn yields averaged only one-third to one-fourth the US level (see the table).

Comparative Yields  
of Corn and Soybeans  
1972

	Bushels per Acre	
	Corn	Soybeans
United States		
Illinois	108	35
Iowa	114	36
Indiana	98	28
Missouri	88	28
National average	94	28
Brazil		
Parana	30-35	27
Rio Grande do Sul	25-30	20
National average	22-24	22

2. Shipping costs to Western Europe are about \$0.15 per bushel higher from southern Brazilian ports than from US ports. Port and handling costs as well as inland freight rates also are higher in Brazil.

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Relative profit considerations would impel the US producer to begin shifting land out of soybeans and into corn when the soybean/corn price ratio was somewhere around 2.3:1, while the Brazilian farmer would still be shifting into soybeans until the ratio fell below 1.5:1. The soybean/corn price ratio is particularly relevant because these crops compete for acreage in both the United States and Brazil. In the four Brazilian states where soybeans are an important crop—Rio Grande do Sul, Paraná, São Paulo, and Santa Catarina—they occupy 14% of the cultivated land and corn takes up about one-third. Corn and soybeans are also the two most important crops in the US midwestern states.

**Brazil's Soybean Potential**

8. During the next couple of years, as in the past, Brazil's potential for expanding output depends largely on continued shifts from other crops and from pasture in already developed farming regions. Area planted to soybeans has quadrupled since 1968, partly because of double-cropping with wheat but mostly because of outright conversion to soybeans. Although this meteoric rise in planted area probably will slow in the years ahead, shifts out of other crops and pasture will continue at a rapid rate because of soybeans' pronounced comparative advantage. Use of natural pastures and other underutilized land in Brazil's four major producing states alone could probably double soybean acreage.

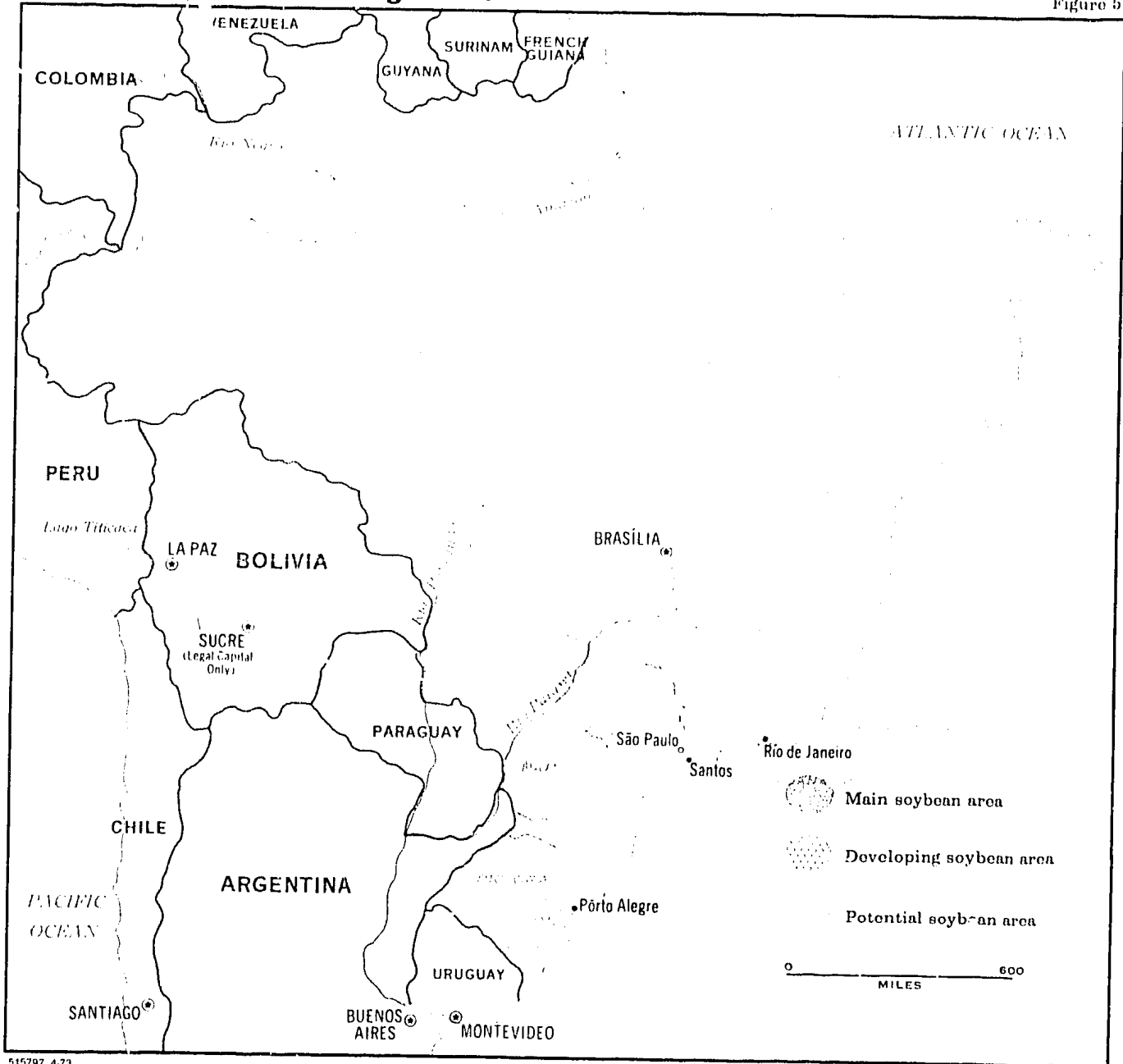
9. Corn, which now covers more than twice the land devoted to soybeans, probably is the most vulnerable crop. Corn yields are not much higher than those for soybeans, while corn prices are only about one-fourth the current level for soybeans. The Brazilian government may try to moderate the shift out of corn by boosting support prices, but it is unlikely to take such counterproductive steps as soybean export taxes to protect corn output. Although additional coffee land is not likely to be converted to soybeans, prevailing high coffee prices will not stimulate much reverse substitution either. Coffee trees require six years before the first harvest, and farmers are unlikely to forgo immediate soybean returns to gamble on coffee prices years hence.

10. Although less important than acreage expansion, increased yields will also play a role in raising Brazil's soybean output. The 10% growth achieved in yields during 1973 is unlikely to continue over the long term, but annual increases of 3% to 5% appear attainable. Yields will be helped by the growing use of certified seed as well as fertilizer and lime, which are now only rarely applied. Perhaps most important, the government and the soybean industry are successfully developing new seed varieties especially adapted to Brazilian growing conditions. Yields should also improve as farmers now double-cropping with wheat shift to soybean monoculture, thus lengthening the growing season.

11. Over the longer run, Brazil's soybean production will benefit most from the settlement of new lands in Mato Grosso and Goiás. Suitable soybean land in these two states alone probably totals at least 10 times the area now planted. Some new varieties specially adapted to the area already have been developed (see Figure 5). These states are largely unsettled, however, and accounted for only about 5% of Brazil's 1972 soybean harvest. The growth of soybean output in these areas will be determined largely by the pace of investment in feeder roads and other infrastructure—now one of the top government priorities. Brazilian firms

### Brazil's Soybean Growing Areas

Figure 5



with processing facilities in traditional soybean areas, as well as international companies such as Cargill, can be expected to follow soybeans into the hinterland.

### **Brazil's Soybean Plans**

12. The harvest that began last month is expected to total some 4.7 million tons, or about 40% more than last year's record level. Area planted increased by an estimated 30%, while average yields are expected to rise from 21.8 bushels per acre to about 24. Because prices should still be relatively high at the mid-year marketing peak, Brazil's export earnings could considerably more than double this year, reaching about \$725 million. High producer profits will encourage even larger plantings this fall, and Brazil's Minister of Agriculture currently is calling for a harvest of 7 million tons in early 1974. Although this goal is not likely to be met, output of as much as 6 million tons is likely, with meal exports reaching 4 million tons in 1974.

13. The Brazilian government is expecting continued rapid increases in output throughout the decade, to as much as 20 million tons by 1980. This goal, which implies a 23% average annual growth during 1974-80, can be reached only if producers are actively encouraged to shift to soybeans and the government finances rapid clearing of new lands. Even if the government continues to promote the crop and producer prices remain favorable, the growth rate seems likely to decline gradually from about 25% next year to about 10% in 1980. Under these circumstances, output would reach 14 million to 15 million tons by 1980, and meal exports would total about 9 million to 10 million tons. Even in the unlikely event that prices fell substantially below historic norms or that Brazil restricted soybeans to protect corn, output in 1980 still would probably increase to about 10 million to 11 million tons, allowing 7.0 million to 7.5 million tons of meal exports.

### **World Market Prospects and Their Implications for the United States**

14. Soybean prices will probably weaken substantially by the end of the year, particularly if Peru's fish catch recovers somewhat by that time. Barring adverse weather in producing countries, world soybean output is expected to rise by a record 18% this year because of increased plantings in the United States and Brazil. Even allowing for consumption increases in both countries, total world export availability of soybean meal during the marketing year 1973/74 appears likely to increase by more than 5 million tons, or 32%. If Peru's fish catch returns to near-normal levels by late 1973 or early 1974, exportable meal supplies from both sources could rise some 36% above the level of the current marketing year. Under these

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circumstances, soybean supplies would exceed import demand by a sizable margin, forcing the United States to carry over surplus stocks for the first time since 1970.

15. Even if soybean prices decline, Brazil can be expected to continue increasing plantings at a fairly rapid rate because of its pronounced comparative advantage in soybean production. US plantings, however, probably would level off, as they did when carryover stocks built up during 1967-69. Lower soybean prices could even cause some US farmers to shift to corn, especially if the soybean/corn price ratio falls below the historic average of 2.3:1. Should additional large Soviet purchases or continued Peruvian fishmeal shortages strengthen import demand more than expected in 1974, the expected stock buildup would be postponed for a year or so and prices would decline less than would otherwise be the case. In such an event, however, Brazil's expansion rate would be even more rapid, and US output would continue its rise. Once it develops, the problem of US carryover stocks could be prolonged because Brazil's rising exports would increase the difficulty of working them off.

16. Brazil's surging soybean exports will have little effect on US sales during 1973, even though its market share will reach nearly 20%. Because of improved harvests and high prices, US export proceeds from soybeans could exceed \$3 billion this year, compared with \$2.1 billion in 1972. Brazil almost certainly will cut into US export gains in 1974, however. Despite a higher sales volume, US earnings from soybean products will flatten out if prices weaken as expected.

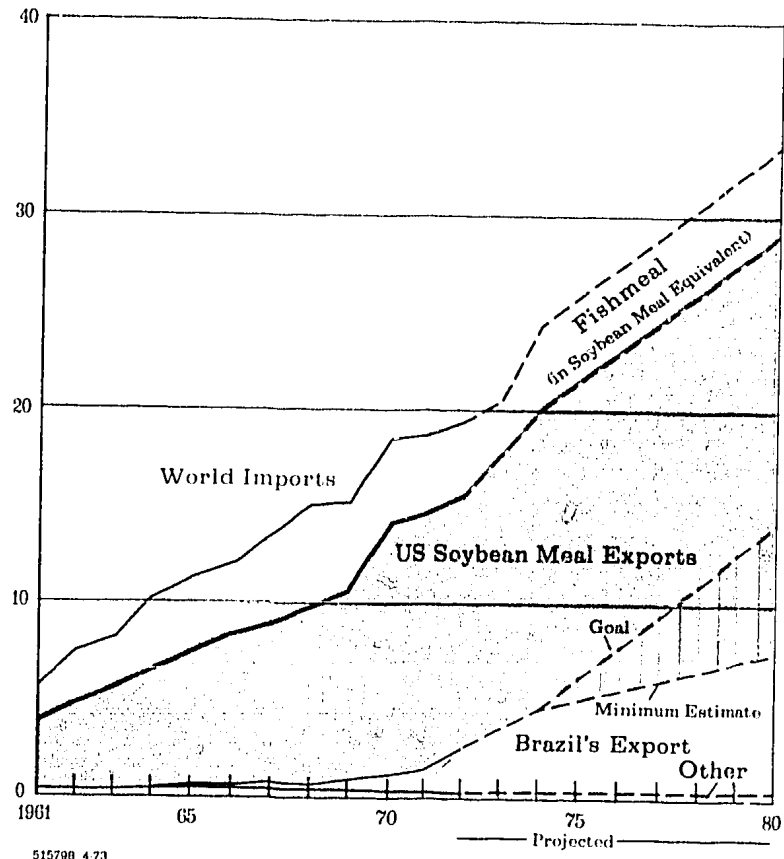
17. Over the longer term, Brazilian competition could cut into the growth in US export volume, as well as continuing its downward pressure on prices. Even with a marked slowdown in its production growth rate, Brazil should be able to capture at least 25% of the soybean market by 1980 (see Figure 6). If it achieves its highly ambitious output goal of 20 million tons, Brazil could satisfy almost half of the total import demand now projected for 1980. Thus, should prices return to the average of the late 1960s, US earnings from soybean exports in 1980 would total \$3 billion under the best-case assumption that the United States retains 75% of the market and \$2 billion under the worst-case assumption that its market share slips to one-half.

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Figure 6

### World Demand for Fish and Soybean Meal

Million Metric Tons



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