# EXPANDING THE NORTHWEST'S SHARE OF THE U.S. POTATO MARKET THROUGH IRRIGATION DEVELOPMENT

by
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Considerable potential exists in the Pacific Northwest for increasing irrigated crop land. In the past, a popular crop for newly irrigated crop land has been potatoes. Recent research at Washington State University analyzed the effects of continued growth in Pacific Northwest potato production resulting from increasing irrigated crop land. The results of the analysis indicate that modest growth of potato production in the Pacific Northwest would not cause a severe oversupply of potatoes on the market.

This growth is possible for two reasons. Potato consumption is increasing. Therefore, the market will tolerate larger supplies of potatoes over time without depressing prices. The other growth stimulant is expansion of irrigated areas in the Pacific Northwest. Traditionally, the higher yields per acre have more than offset the higher costs of irrigated production.

The major sources of growth in consumption of potatoes over time are changes in the tastes and preferences, population, and to a lesser extent, increases in income.

In the U.S. diet, there is relatively little variation in the level of consumption of potatoes as income increases. A 10 percent increase in real per capita income is required to generate a 1.1 percent increase in fresh per capita consumption. This same increase in real per capita income increases per capita consumption of processed potatoes 6.6 percent. In other words, only modest gains in consumption are achieved through increases in income.

Population growth does increase total consumption. However, population growth in the U.S. is now quite low. Growth in total consumptions caused by increases in population, alone, will likely be very modest.

The major source of growth appears to be changes in tastes and preferences. Using the number of women in the labor force as a proxy for tastes and preferences, two changes were measured. The continuing upward trend of women in the labor force means a continued decline in the consumption of fresh potatoes. A 1 percent increase in the number of women in the labor force reduced fresh per capita consumption by 1 percent. This same upward employment trend indicates continued growth in the consumption of processed potatoes. A 1 percent increase in the number of women in the labor force increased processed per capita consumption by 4.7 percent. The overall effect of increasing numbers of women in the labor force is an increase in the total demand for potatoes.

Combining the effects of income, population, and tastes and preferences, the growth in per capita consumption trends may be on the order of 2-3 percent per year. It is important to reiterate that these are trend estimates. Year-to-year variations in consumption levels, and prices, will continue to occur as a result of variations in production.

All producing areas will be competing for a share of the expected increase in consumption. At the same time, competition will continue for the current market. Can the Pacific Northwest compete successfully? The advantage in production per acre has already been mentioned. However, location is a disadvantage. Taking the projected consumption growth, production trends, location, and other significant factors into consideration, potential growth

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patterns for various regions of the U.S. have been projected. While the projected trends presented here show the Pacific Northwest as compared to the rest of the U.S., the study was based on six distinct producing regions.

It should be noted that no distinction was made between potatoes going to processors and potatoes going to the fresh market. Nor was the effect of contracting on acreage evaluated.

Using historical trends in population, per capita real income, women in the labor force, potato yields, and acreage responses to yearly price variations potential growth patterns were estimated. All prices were assumed to remain constant at 72-76 averages except potato prices. Potato prices were allowed to fluctuate in response to changing conditions of supply and demand.

Using 1955-1975 data as a base, estimates were made of potential growth if historical trends continued. Two other sets of estimates were developed. One set of projections is based on the assumption that the growth rate in acreage planted would be 25 percent greater than the historical rate. The other set of projections assumed a 50 percent greater growth rate. The increased growth was assumed to begin in 1976. The study indicated that potato acreage in the Pacific Northwest increased at a rate of about 7,000 acres per year. The baseline estimate reflects this growth rate. At constant prices, a 25 percent increase in this growth rate implies an additional 1,750 new acres planted to potatoes each year; the 50 percent increase represents an additional 3,500 acres each year. Estimates were made of production levels in the Pacific Northwest and other regions, fresh and processed consumption, U.S. and Pacific average price, and acreage planted.

The continuation of past trends would result in the growth of acreage planted of about 13.9 percent nationally between 1980 and 1990. A 25 percent increase in the rate of growth in the Pacific Northwest would reduce the national growth to 13.3 percent. A 50 percent increase would reduce the national growth to about 12.7 percent.

Figure 1 depicts the projected growth in the Pacific Northwest.[1/] Historical trends would result in growth of about 24.5 percent. A 50 percent increase in growth rate would result in growth of about 33.5 percent in Pacific Northwest potato acreage by 1990. The projected effect of a 25 percent increase in the rate of growth is 29 percent more acreage by 1990.

The small projected increases in national acreage and the large projected increases in Pacific Northwest acreage indicate that acreage in some other regions of the U.S. must be exhibiting very little growth. Historical growth trends indicate 7.7 percent increase in acreage in other regions of the U.S. With more rapid rates of growth in the Pacific Northwest, the growth in other areas would be even less. In fact, with the 50 percent increase in the growth rate in the Pacific Northwest, acreage in other regions was projected to decline slightly. In other words, the more rapid the rate of growth in the Pacific Northwest, the larger the market share for Northwest potato growers. Figure 2 depicts the projected growth patterns for the rest of the U.S.

The projected shift in acreage to the Pacific Northwest has considerable effect on total production. Total U.S. production is projected to increase about 30 percent during the 1980s. Yet the difference between total U.S. production comparing the base projection and the most extreme growth projection is only 1 percent in 1990. Substantial shifts would occur among regions. Figure 3 shows projected U.S. production.

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1/ In all figures: (A) represents the growth trend based on historic data, (B) represents a 25 percent increase in the rate of growth in potato acreage or the effects of the increase, and (C) represents a 50 percent increase in the rate of growth.

Figure 4 shows the projected trends in Pacific Northwest production. Growth ranges from 45 percent to 56 percent. The difference between the low and the high estimate is approximately 11 percent in 1990, or about 27 million cwt. All three projections indicate that the Pacific Northwest share of the U. S. market would increase to at least one-half of the total market. The most rapid growth rate would result in a market share of approximately 55 percent.

The growth in the supply from other regions would also increase but at a much slower rate than the Pacific Northwest. The rate of growth in the other regions would vary inversely to the Pacific Northwest growth rate. The more rapid the growth in Pacific Northwest supply, the lower the growth rate in other regions. Figure 5 shows these projected trends.

With such large increases in production and only modest increases in demand, there is bound to be some decline in real price. Figure 6 indicates the price trends.

With all three growth trends projected, real prices decline until 1985. The projected "normal" growth trend increases sufficiently to be higher in 1990 than in 1980. By the mid-1980s, growth in demand has caught up with production growth. While the 25 percent growth rate also begins to reflect increasing prices in the mid-1980s, this production growth rate is sufficient to meet the increasing demand. The most rapid production growth rate was projected to remain ahead of the increasing demand throughout the 1980s.

It should be noted that the price differences in 1990 among the projections are not as severe as might be inferred from Figure 6. The difference between the highest projected real price/cwt. and the lowest real price/cwt. is less than 8 percent.

Projected U. S. average real prices would follow trends similar to the Pacific Northwest real price. The average declines would be somewhat more for the U. S. because of the increasing amount of Pacific Northwest potatoes in the market which would lower the U. S. average real price.

The other set of projections of interest concerns demand for potatoes. Figure 7 portrays the trends in fresh and processed consumption for the next decade. Fresh consumption is expected to grow only marginally with an increase of slightly more than 2 million cwt. between 1980 and 1990. Continued strong growth is projected for processed potatoes. An average annual growth rate of approximately 5 percent is estimated for each of the projected growth rates in production. Very little variation in processed consumption occurs between production growth rates.

## SUMMARY

Increased growth in acreage planted in the Pacific Northwest: (1) could increase the Pacific Northwest market share from 44 percent to as much as 56 percent; (2) real prices would decline, however, the decline would reverse itself for the slower growth rates in the second half of the 1980s; (3) the difference in prices would be about 8 percent by 1990; (4) essentially all of the growth in demand would result from increased consumption of processed potatoes.

## CAVEAT

This analysis did not evaluate prices in terms of the economic viability of individual operations under conditions of more rapid growth in acreage planted to potatoes.

## SELECTED REFERENCES

Blakeslee, L. "Expanding the Northwest's Share of the U.S. Potato Market Through Irrigation Development." Mimeo. Dept. of Ag. Econ., Washington State University, Pullman, Washington.

Estes, Edmund and et. al. "U.S. Potato Demand: Static and Dynamic Characteristics." Paper presented at AAEA Summer Meetings, Pullman, Washington, 1979. Dept. of Ag. Econ., Washington State University, Pullman, Washington.

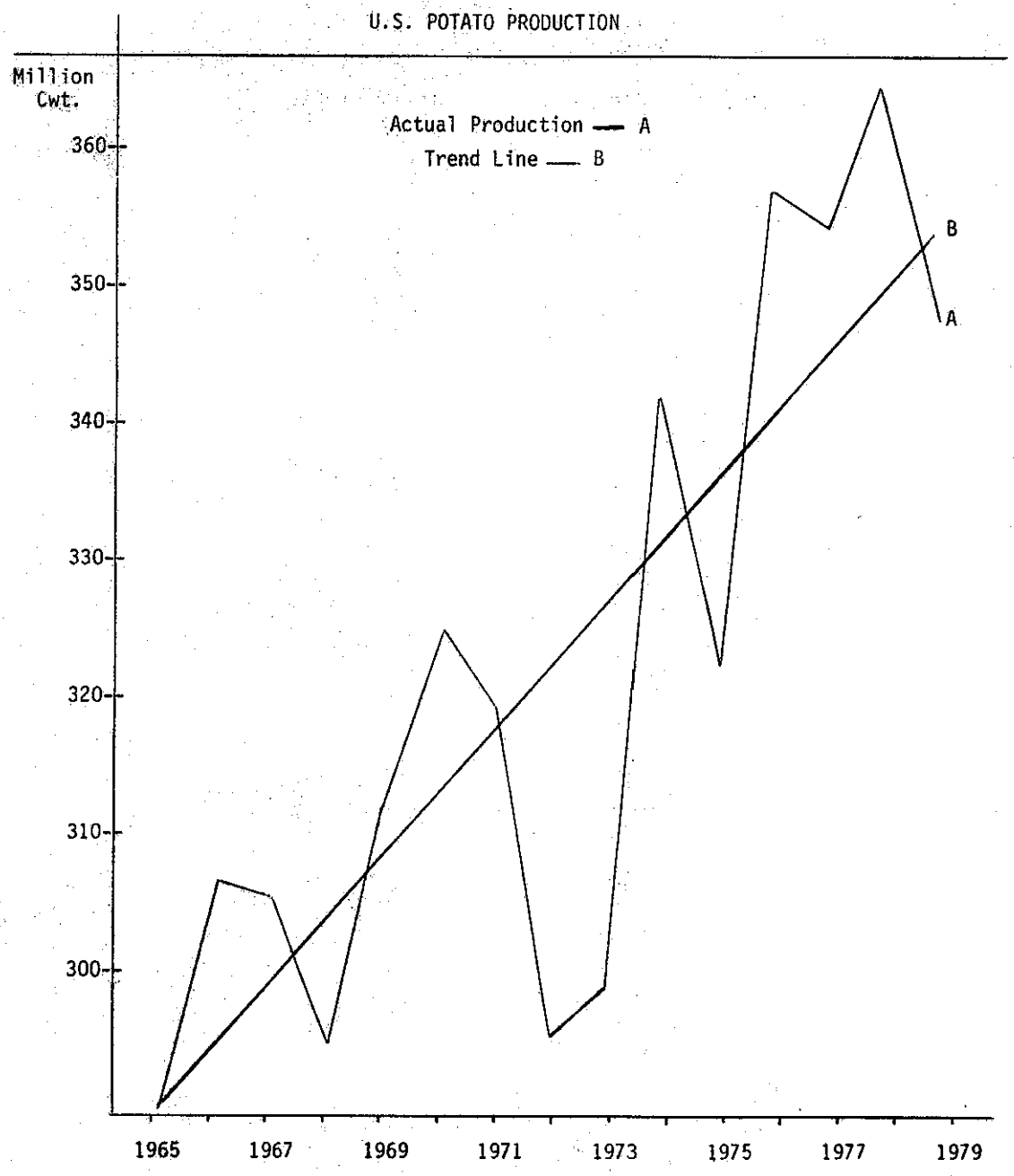

FIGURE I

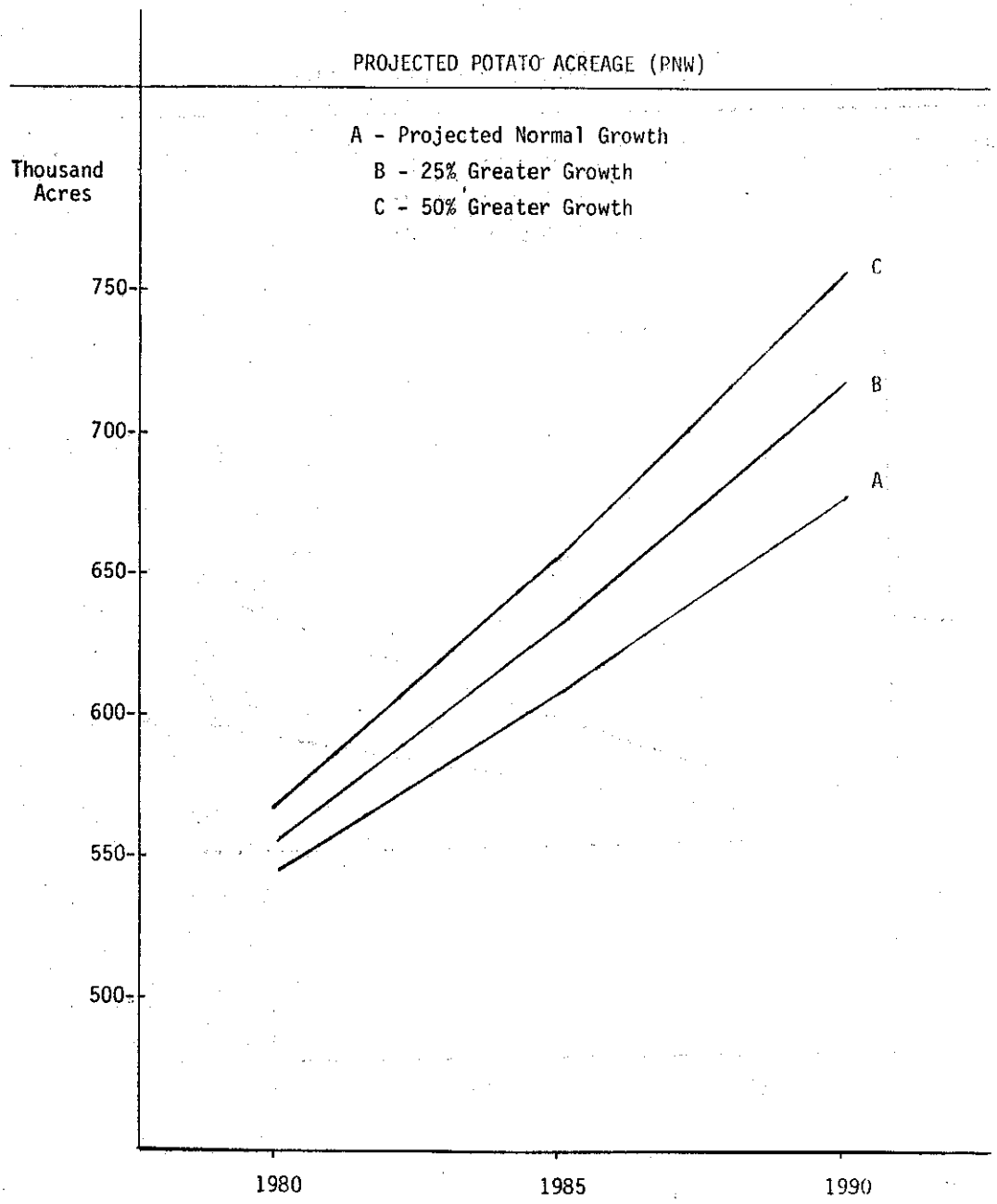
PROJECTED POTATO ACREAGE (PNW)
A - Projected Normal Growth
B - 25% Greater Growth
C - 50% Greater Growth
Thousand Acres
750
700
650
600
550
500
1980
1985
1990
C
B
A

FIGURE II

PROJECTED OTHER STATES POTATO ACREAGE

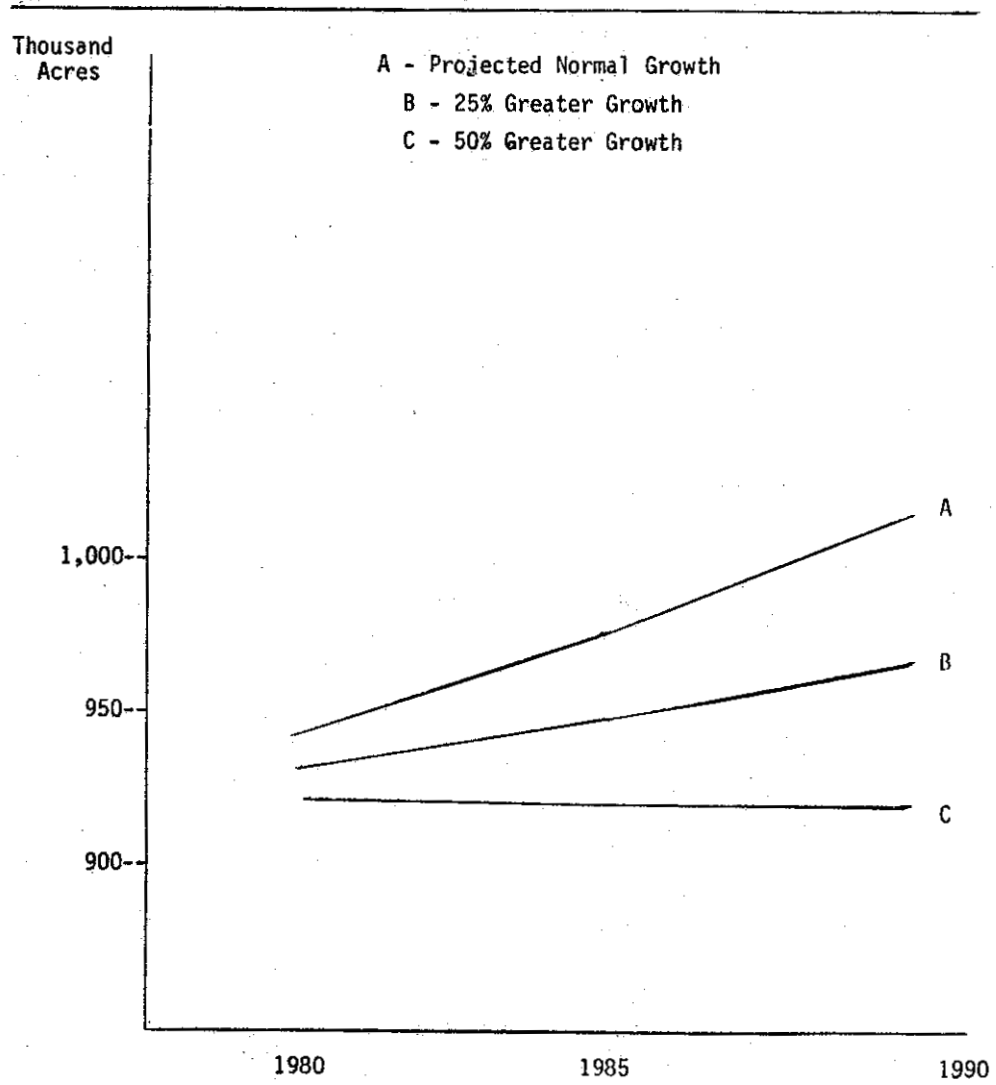

FIGURE III

PROJECTED U.S. POTATO SUPPLY

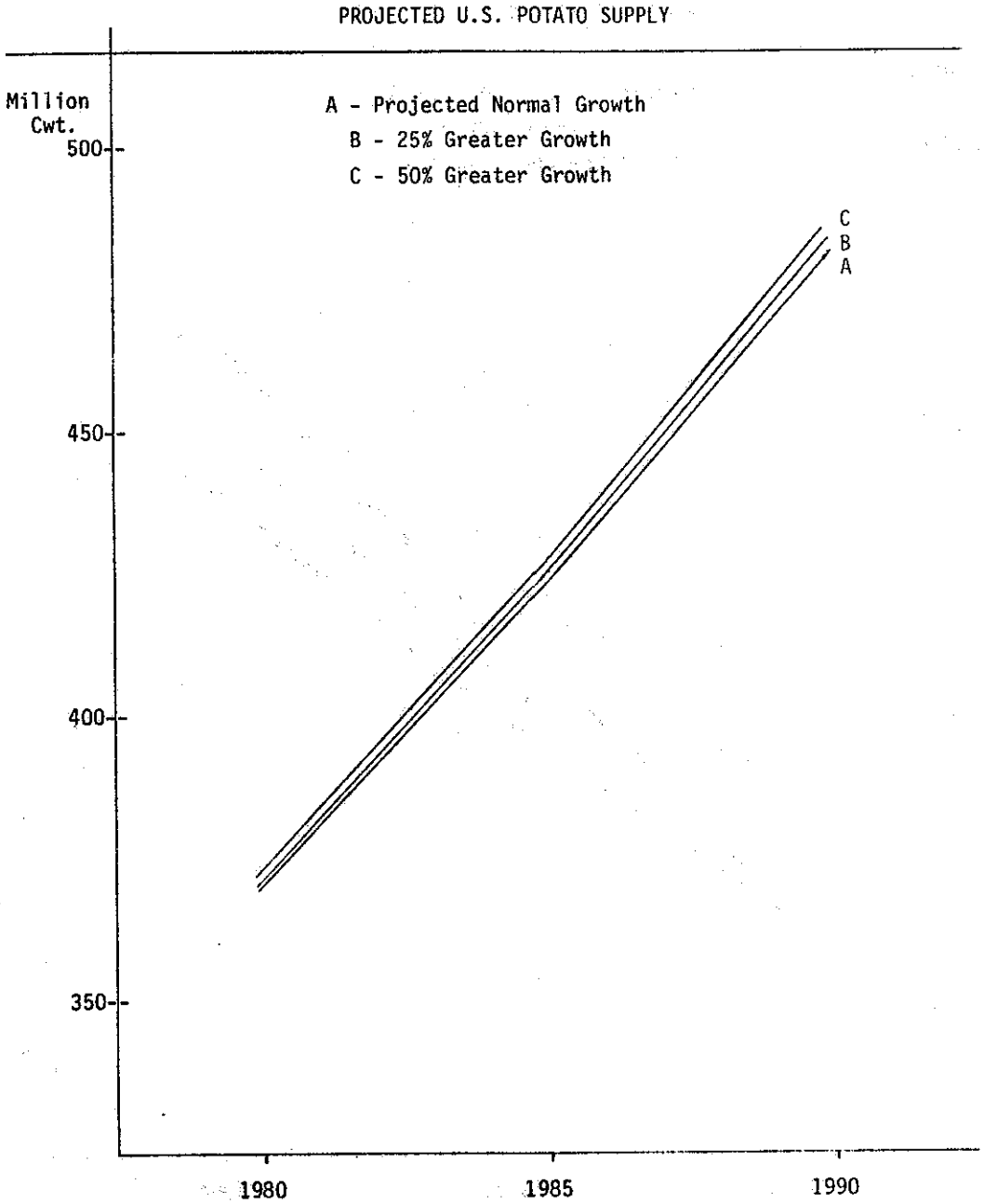

FIGURE IV

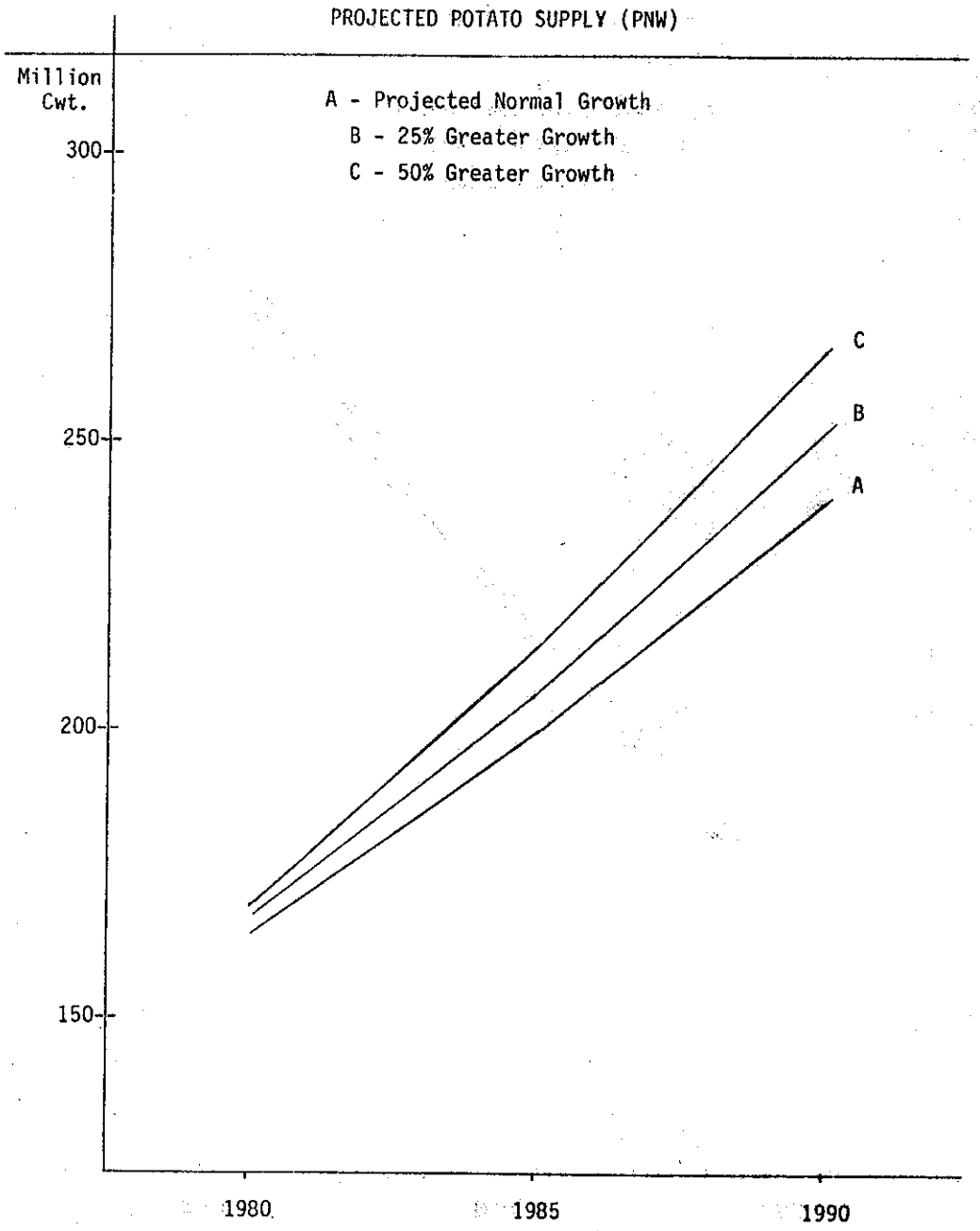
PROJECTED POTATO SUPPLY (PNW)
Million Cwt.
A - Projected Normal Growth
B - 25% Greater Growth
C - 50% Greater Growth
300
250
200
150
C
B
A
1980
1985
1990

FIGURE V

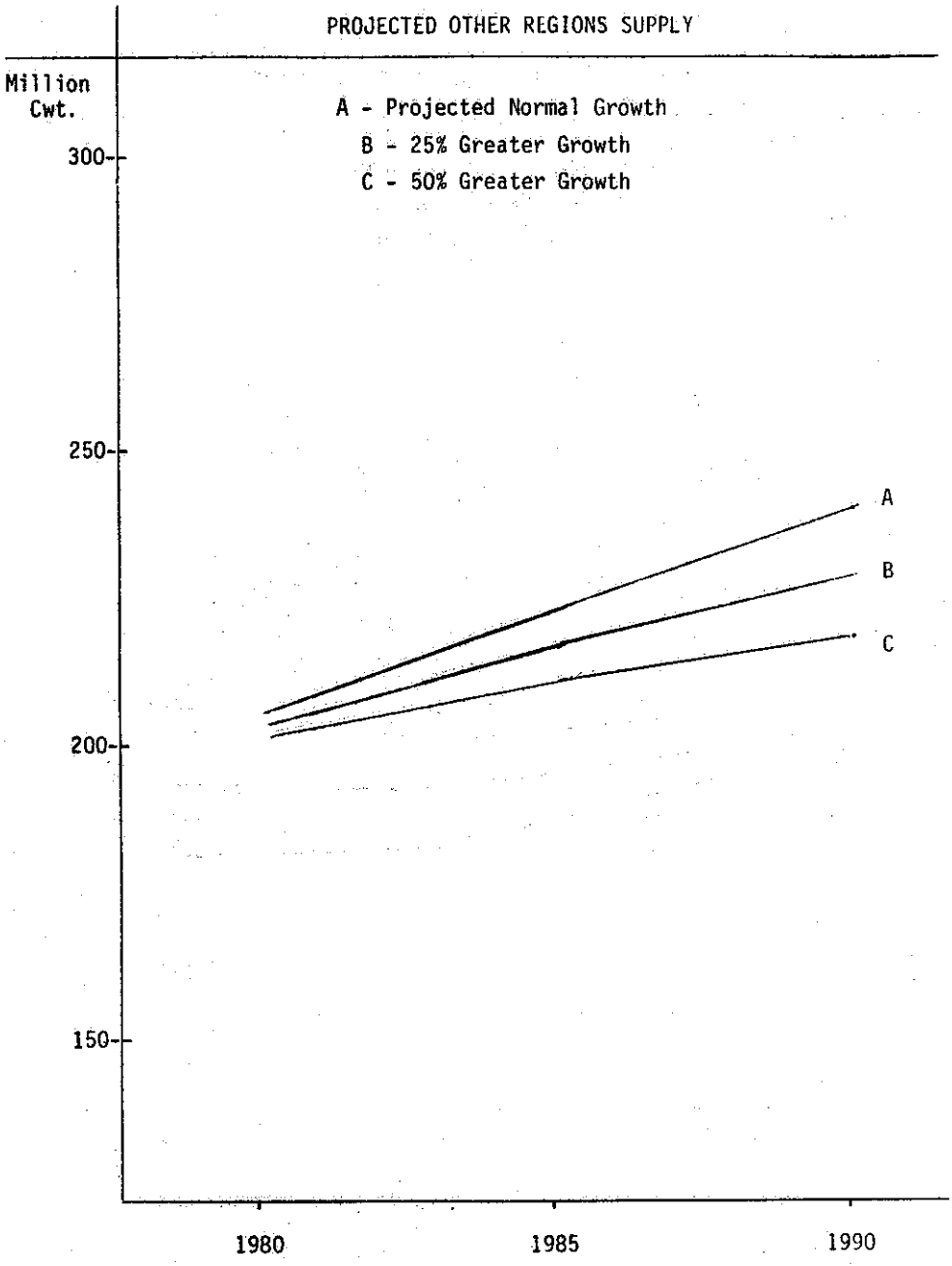
PROJECTED OTHER REGIONS SUPPLY
Million Cwt.
A - Projected Normal Growth
B - 25% Greater Growth
C - 50% Greater Growth
300
250
200
150
A
B
C
1980
1985
1990

FIGURE VI

PROJECTED AVERAGE REAL POTATO PRICE (PNW)

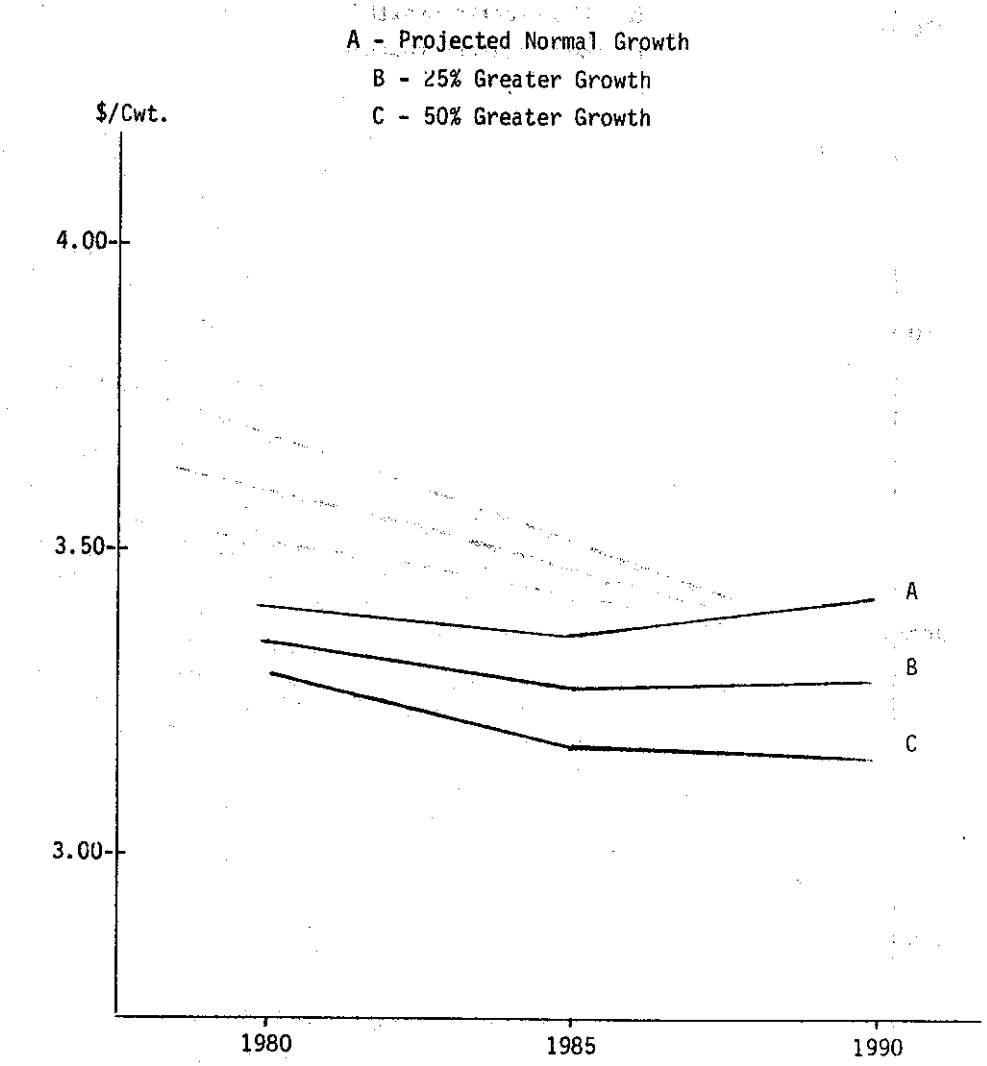

FIGURE VII

PROJECTED U.S. DEMAND FOR POTATOES