



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Minnesota AGRICULTURAL ECONOMIST



NO. 561

NOVEMBER 1974

Seasonal Behavior Of Minnesota Farm Prices

By James P. Houck
Introduction

THESE ARE times of great uncertainty in agricultural prices and incomes. Yet, *within* these tumultuous years, the systematic forces of climate, biology, and tradition are still shaping price behavior. This issue of *Minnesota Agricultural Economist* examines seasonal price patterns for Minnesota farm products.

Table 1. Importance of various commodities in the total value of cash farm marketings in Minnesota, 1972.

Item	Percent of total value of cash farm marketings
Cattle and calves*	25.2
Steers and heifers	16.5
Cows	8.1
Calves	0.6
Dairy products	20.2
Manufacturing milk	15.2
Fluid milk	5.0
Hogs	13.6
Soybeans	11.9
Corn	9.7
Turkeys	3.1
Wheat	3.0
Eggs	1.9
Oats	1.5
Barley	1.2
Potatoes	0.9
Hay	0.7
Other products	7.1
Total	100.0

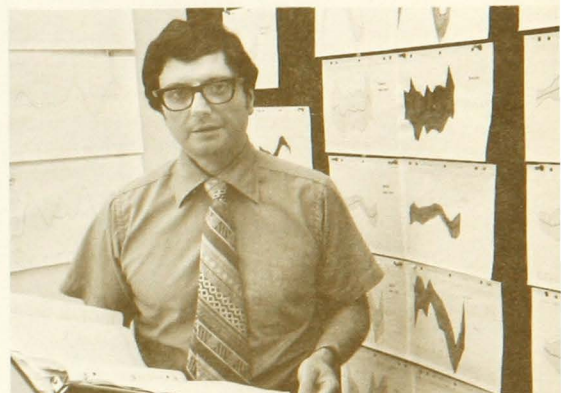
*Excludes interfarm sales.

Source: *Farm Income: State Estimates*, FIS 222, ERS, USDA, August 1973 and data from *Minnesota Agricultural Statistics*, 1973, Crop and Livestock Reporting Service, Minn. Dept. of Agr. and USDA, March 1973.

What are seasonal price patterns, and why are they worth looking at? In Minnesota, growers market most farm commodities throughout the entire year. Even so, the flow of products to market is not uniform. In some cases, market requirements are not identical from month to month. This unevenness of forces of both supply and demand can produce distinct seasonal price movements. These endure whether long term trends are rising, falling, or holding steady. Prices tend to be consistently higher than average during some months and consistently lower than average other months. And these patterns differ from commodity to commodity.

For most farm commodities, the dominant cause of seasonal price fluctuation is month-to-month variation in marketings and supplies. This variation is caused by patterns of reproduction and growth in livestock and by annual harvests of crops. Demand patterns may also change seasonally. They do this as price relationships alter among substitute products and as buyers' requirements change.

If sellers and buyers of farm products are familiar with these patterns and their strengths, they can improve their marketing strategies. With knowledge about typical seasonal price movements, farmers and others can evaluate current information more accurately. Then they can make marketing decisions that are more likely to be profitable. Also, if a commodity has no clear seasonal price pattern, then buyers and sellers can plan their marketing strategies on whatever immediate knowledge they have—ignoring seasonality. In this article, we will discuss seasonality and marketing strategy from the farmer's viewpoint.



The author is professor of Agricultural and Applied Economics, University of Minnesota. Mr. Henry Hwang and Mrs. Pam Beckman assisted in the computations and analysis.

The Data and the analysis

As with other economic research, seasonal price analysis is not a perfect science. This is because: (1) seasonal price patterns do not occur with precision year after year; and (2) measurement and analysis tools are not completely accurate. But within these limits, we can see how Minnesota farm prices behave from season to season.

Seasonal price patterns were computed and analyzed for Minnesota's 15 leading farm products. These products, shown in table 1, account for about 93 percent of Minnesota's cash farm income from marketings. Calculations were performed on monthly farm prices of these 15 commodities for the 21-year period 1953-73. These calculations, known as the "ratio to centered 12-month moving average method," mathematically removed: (1) longrun price trends; (2) price

The data used in these analyses are midmonth prices received by Minnesota farmers as reported by the State-Federal

Crop and Livestock Reporting Service, Minnesota Department of Agriculture and the U.S. Department of Agriculture. Sum-

maries of these prices appear in the annual issues of *Minnesota Agricultural Statistics*, Minn. Dept. of Agr. and U.S. Dept. of Agr.

cycles (important in some livestock products); and (3) irregular price variations.¹ What remained was the seasonal price pattern, if any existed.

In addition, this method showed if the emerging seasonal pattern is strong and regular or weak and irregular. Unfortunately, these calculations cannot tell *why* various patterns occur; they only tell *what* the patterns look like.

Each of the 21-year patterns was examined month-by-month to see if seasonality had remained constant or had changed with time. For products in which the seasonal price movements were apparently changing, the data were reanalyzed using a shorter period of years. Seasonal price patterns can change for many reasons. For example, changes in production and storage technology can neutralize some effects of annual weather changes and natural biological cycles.

In the following sections, the seasonal price behavior of each

product shown in table 1 is illustrated and discussed. The focal point of each section is a diagram which: (1) shows the typical seasonal price pattern for that product; and (2) gives a visual impression of the strength of the pattern. The solid black line in each diagram is the seasonal price index. The shaded area is called the "zone of irregularity." The shaded zone measures the area around the index within which about two-thirds of all the monthly observations fall. A narrow zone indicates a strong seasonal pattern; a wide zone suggests a weak pattern. (This zone of irregularity is one standard deviation above and below the average monthly index value.) The scales on the diagrams differ between some commodities, so caution should be used in visually comparing the patterns.

Cattle and calves

More than one-fourth of Minnesota cash farm income comes from the sale of cattle and calves for slaughter (table 1). Steers and heifers comprise much of this income, but cull dairy and beef cows are also important. Calves account for only a small part of this total.

Figure 1 shows the Minnesota seasonal price index and the zone of irregularity for steers and heifers. This seasonal pattern of price behavior is a bit weak and not well-defined. Prices for steers and heifers tend to hit their annual maximum in June and then slide to a yearly low in November and December. The wide shaded area around the index indicates quite a bit of variation in this pattern. However, cattle raisers who always strive for early summer sales can expect to receive prices about 4 percent higher than average and about 10 percent higher than those who consistently sell in November and December.

Figure 2. Seasonal behavior of Minnesota cow prices.

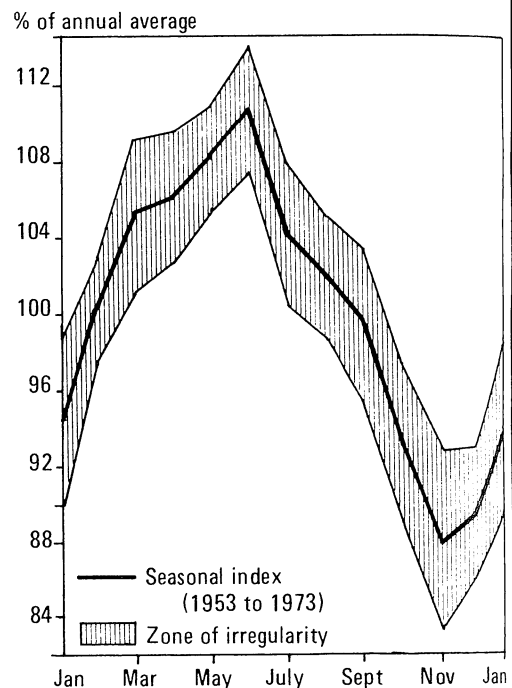
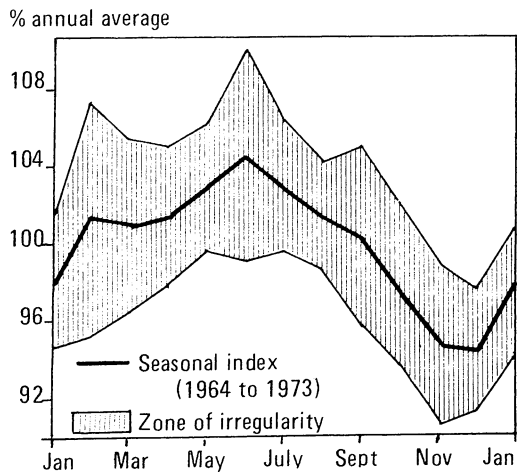
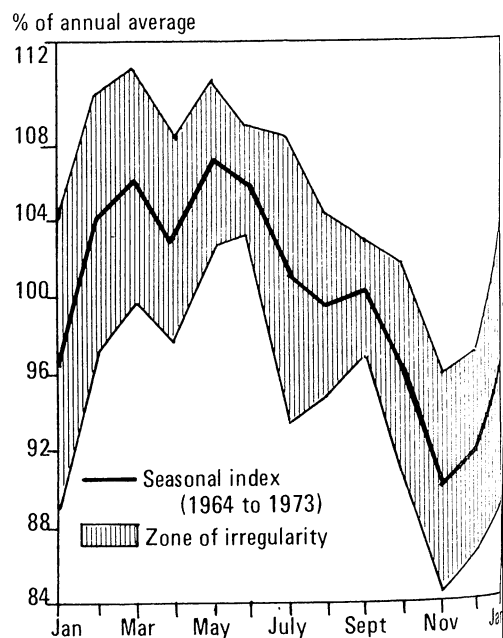


Figure 1. Season behavior of Minnesota steer and heifer prices.



¹Most statistics textbooks give computational details. An example is: Taro Yamane, *Statistics: An Introductory Analysis*, 2nd ed. (New York: Harper and Row, 1967).

Figure 3. Seasonal behavior of Minnesota calf prices.



The seasonal price pattern for cows (figure 2) is much stronger and more clearly defined than for steers and heifers. The general shape of the pattern is the same—high in June and low in November and December. But the shaded area around the index is much narrower. The marked seasonality of milk production adds strength to this price pattern through its effect on dairy herd culling. Few cows are culled in early summer. Many are culled as winter weather closes in. By consistently selling cows in June, farmers can expect to obtain prices about 10 percent over the annual average and approximately 20 percent higher than in November-December.

The calf price index (figure 3) is much more irregular and diffuse than the other cattle price indexes. It is marked by wide variation and uncertain behavior. The major tendency is similar to that for other cattle. Highest annual prices tend to occur in spring and early summer. Annual lows tend to cluster around November. The wide and changeable zone of irregularity suggests that this general tendency is often upset from year to year.

The marketing strategy suggested by seasonal price movements for cattle and calves may conflict with technically efficient production. That is, production costs may be minimized by holding cattle on cheap summer pasture and roughage and not retaining stock over the winter. But intelligent balancing of both technical efficiency and economic opportunity identifies the successful manager. Naturally, this balancing must be kept in mind for all products.

Dairy products

The production and sale of milk is a major Minnesota farm business. It generates about one-fifth of Minnesota's cash farm income. Some milk is used in fluid form, but most moves into manufacturing uses (table 1). Farm milk prices follow distinct, tight seasonal patterns year after year (figures 4 and 5).

These seasonal price patterns result from the marked seasonality in milk production caused by the changing availability of natural pasture and roughage. Market

regulations in the dairy industry—especially those designed to stabilize the fluid market—also contribute to these systematic price patterns. The seasonal price indexes for manufacturing and fluid milk are virtually identical. Prices fall from the beginning of the calendar year until their low point in June. They increase until October and November when the annual price peak occurs.

This yearly price fluctuation spans about 12 percent of the average price. Figures 4 and 5 suggest that producers should level out their milk production throughout the year. Of course, this may result in higher costs and requires skillful management. Still, income gains are possible.

Hogs

Hog sales bring in slightly less than 14 percent of Minnesota cash farm income (table 1). The seasonal price picture (figure 6) does not have strong, clearly defined swings. The 4-year cycles in hog prices and production are much more striking, but these are not illustrated. All that can be said is that August prices tend to be high relative to the rest of the year. August prices also display smaller variation around that average high than do variations in other months. After August, prices tend to fall to annual lows in November and December, but wide price variations occur around these lows.

Based on prices received, it is difficult to identify a yearly hog marketing strategy. The seasonal behavior of corn prices, discussed later, also is important as is the position in the longer run hog cycle. However, if hog farmers consistently aim for late summer sales and avoid winter marketings, they should do better than average in prices received—maybe as much as 10-12 percent better on the average. As always, this requires good management.

Soybeans

Minnesota's most important cash crop is soybeans (table 1). Soybean prices are extremely difficult to predict from past patterns. Figure 7 verifies this. It is not easy to see a striking, consistent pattern. (Various periods were examined to see if a more definite seasonal pattern could be discovered. This

Figure 4. Seasonal behavior of Minnesota manufacturing milk prices.

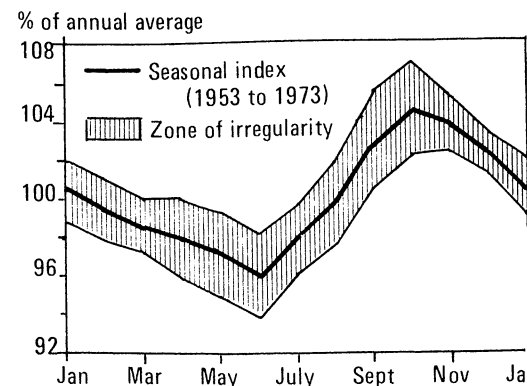


Figure 5. Seasonal behavior of Minnesota fluid milk prices.

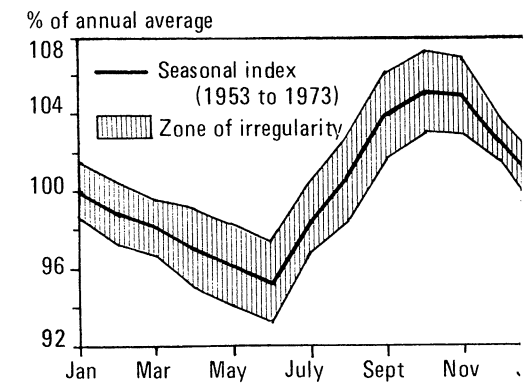


Figure 6. Seasonal behavior of Minnesota hog prices.

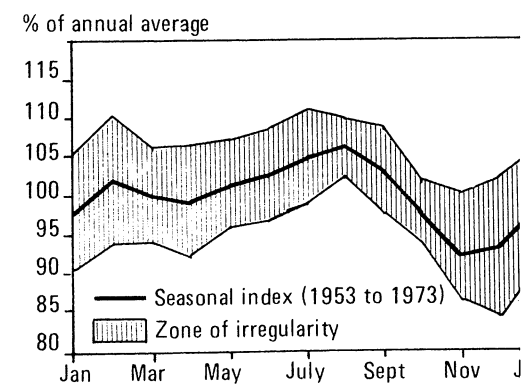
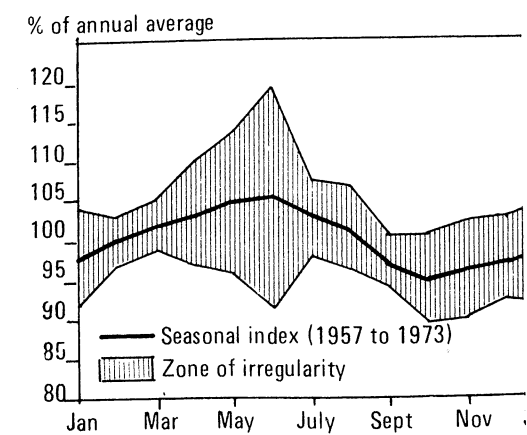


Figure 7. Seasonal behavior of Minnesota soybean prices.



one, 1957-1973, is as good as any others.) Two observations can be made. First, a rather long, slow, 10 percent price decline tends to begin about July and continues until new harvest in October. Then a long, slow price recovery usually gets under way until the following June.

Second, price variability around the seasonal index is sizeable throughout the whole year, but it becomes extremely wide in April, May, and June. In these months,

Figure 8. Seasonal behavior of Minnesota corn prices.

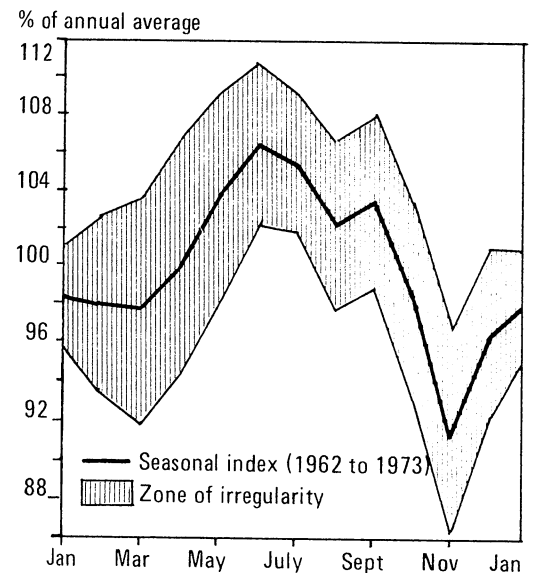
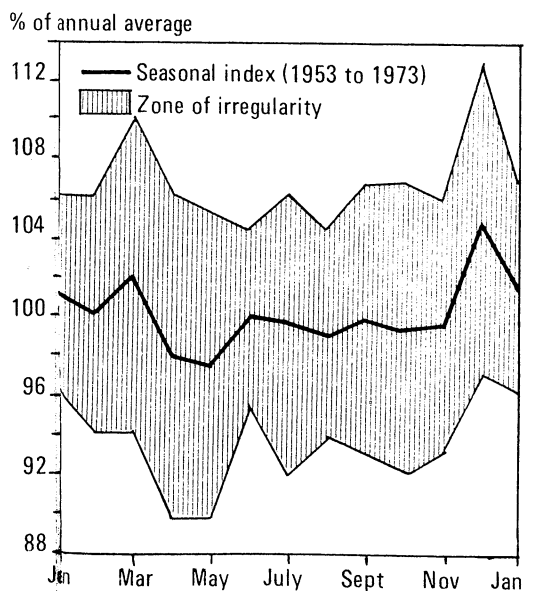


Figure 9. Seasonal behavior of Minnesota turkey prices.



anything can happen. Much depends on the marketwide stocks position. The variability of seasonal prices decreases as the harvest approaches and gets under way. A possible soybean selling strategy for farmers may be to concentrate sales in February and March. Then the price variability is the lowest and prices are at about their yearly average.

Corn

More corn is produced in Minnesota than any other crop; however, much of it is fed to livestock on farms where it is grown. Still, corn sales account for about 10 percent of the state's cash farm income from marketings. Corn prices display a more distinct seasonal pattern than do soybean prices (figure 8). As with soybeans, corn prices tend to hit their annual lows in November—after a fairly sharp 8-9 percent drop during September-November. Prices often recover quickly and then peak in June. The rather wide zone of irregularity in figure 8 indicates that any year's corn price may be much different than the average—especially in spring and early summer.

Cash corn sellers should avoid November sales because of harvest time price lows. Sales in June-July, generally speaking, will generate the highest seasonal prices. Of course, this advice needs to be tempered with close consideration of storage costs and available bin space. Marketing flexibility is available only to producers with ample onfarm storage space or access to low cost commercial storage.

Turkeys

Turkeys now account for over 3 percent of the state's cash farm marketings (table 1). Minnesota turkey prices have virtually no seasonal regularity. Figure 9 illustrates that the annual price behavior is marked by wide fluctuations and no apparent systematic movement. On this evidence, it is impossible to suggest any seasonal marketing strategy. Short run price and market information and good luck are needed. Even with its highly seasonal retail demand, the Minnesota turkey market shows the least seasonal regularity among all 15 products analyzed.

Figure 10. Seasonal behavior of Minnesota wheat prices.

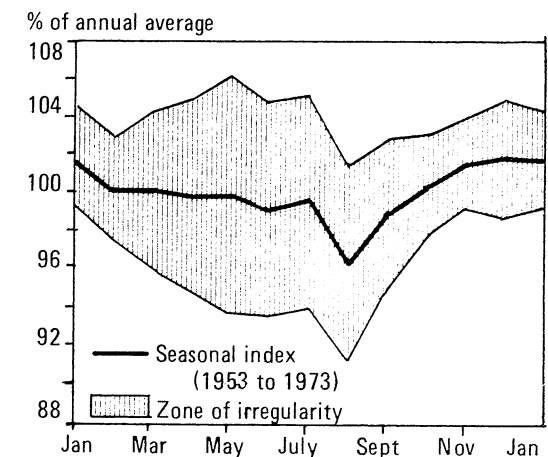


Figure 11. Seasonal behavior of Minnesota egg prices.

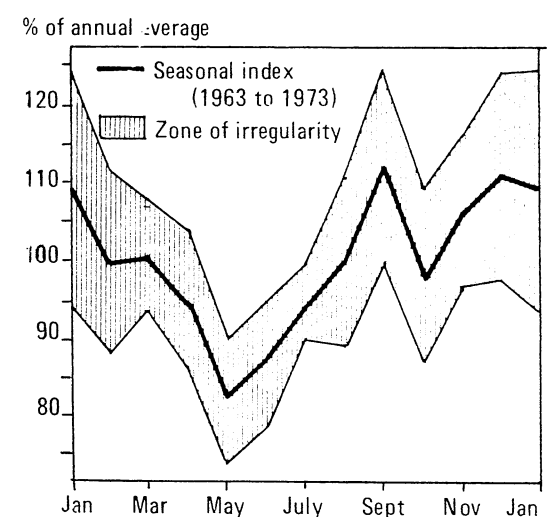
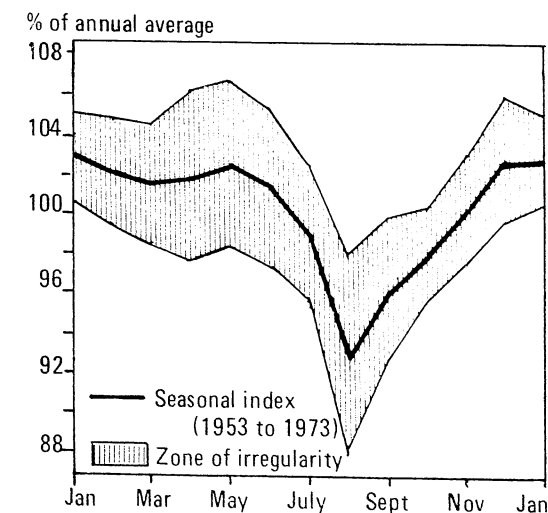


Figure 12. Seasonal behavior of Minnesota oats prices.



Wheat

Wheat and turkeys in Minnesota are almost equal in cash income importance. Wheat's seasonal price picture (figure 10) shows two things. First, with the exception of a 3-4 percent slump during August harvest, the seasonal price index departs little from its average yearly value. This is because wheat has complete, open, worldwide cash and futures markets.

Second, price variation around the index seems to increase noticeably toward the end of the marketing year—in late summer. So, except for avoiding immediate postharvest sales, marketing strategy is difficult when based on seasonal price indexes. Each year's considerations dominate.

Eggs

Years ago, egg prices displayed the classic seasonal price pattern: very low in the spring; very high in the fall; and little irregularity from year to year. Similar seasonal variation in production throughout the nation caused this pattern. Now, modern technology and management is smoothing out the seasonal fluctuation (figure 11).

The egg price seasonal index still does encompass some 25 to 26 percentage points from the top in August to the bottom in May. Moreover, the shaded zone of variation—although fairly wide—still indicates a distinct seasonal movement. Price slumps usually occur twice each year. One is in April-June, and another occurs around October. The October slump is short and sharp, and a rapid recovery appears in November. The widest variation around the index occurs in the winter.

Oats and barley

Together, oats and barley sales account for about 2.7 percent of Minnesota farm income (table 1). Their seasonal price behavior is also similar (figures 12 and 13). Both show little systematic price movement except around harvest. This is especially true of barley; its price index displays almost no change from October to July. A short, sharp drop of about 5 percent occurs in August. This is followed by about a 2-month price recovery period. Price variability around the seasonal index is widest around

harvesttime. It also increases toward the end of the marketing season in May and June.

For oats, the price index and its zone of irregularity indicate a more well-defined price drop of approximately 9 percent at August harvest. Prices show a slower recovery which typically extends until December. As with barley, the oats price variability around its index is most pronounced at the end of the marketing year—May-July. At that time, uncertainty about remaining supplies and the coming new crop is strongest.

Potatoes

Potato sales make up about 1 percent of the state's cash farm marketings. Wide fluctuations are common from year to year and from month to month. Figure 14 illustrates the seasonal potato price situation. Notice the dotted lines for June-July. Because of limited sales, the Crop and Livestock Reporting Service usually does not quote Minnesota farm potato prices those 2 months. So they were omitted from the analysis.

The rest of the year shows a substantial swing in the month-to-month price index. Also for much of the year, there's a high degree of variability around the index. The index swings from about 85 percent of the annual average in the October-November harvest period to about 135 percent in August—just before the new crop begins to move. Perhaps more important is how the zone of irregularity widens dramatically from fall harvest toward spring and summer.

A marketing strategy is difficult. Each year displays its own peculiarities. Fall and early winter prices generally are at or below the annual average, but anything can happen in late season months. Holding potato stocks for late-season sales is a high-risk proposition. Large gains or losses can occur.

Hay

Like corn, much more hay is produced in Minnesota than is sold as a cash crop. Most is fed on the farms where it is grown. Figure 15 shows the seasonal index for alfalfa hay prices received by Minnesota farmers. When hay and natural pasture are plentiful in summer, hay prices are at yearly lows. Beginning in September, prices tend to ad-

Figure 13. Seasonal behavior of Minnesota barley prices.

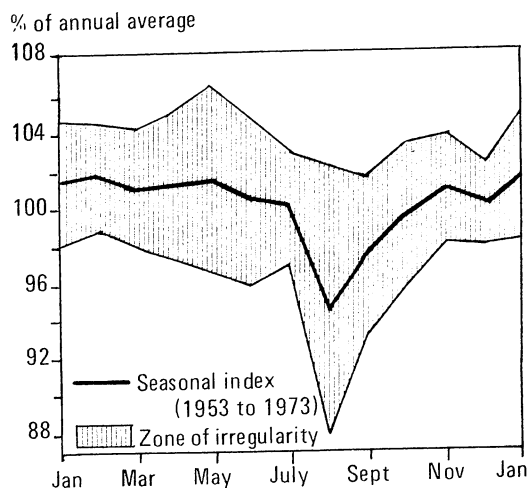


Figure 14. Seasonal behavior of Minnesota potato prices.

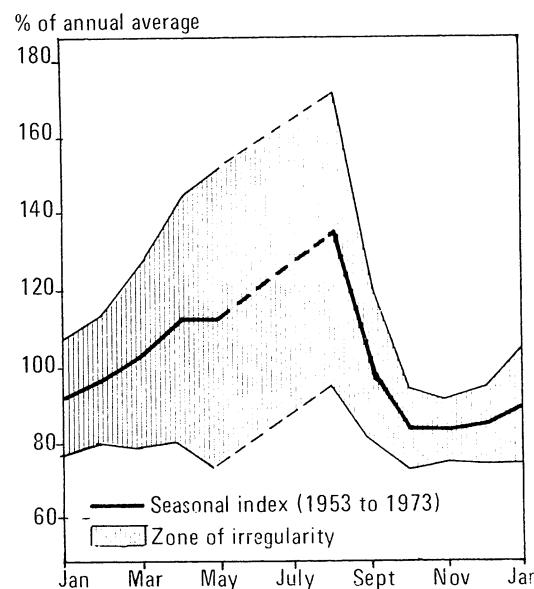
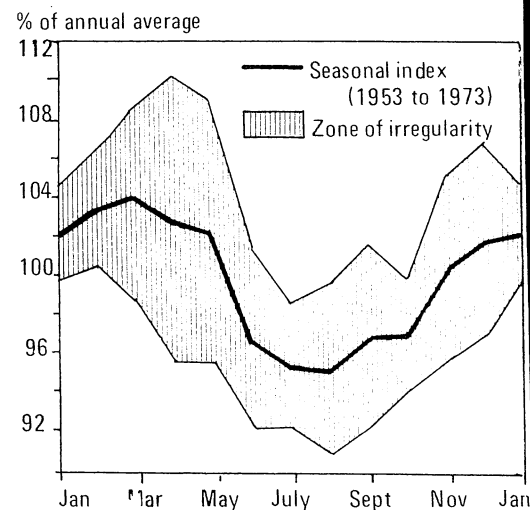


Figure 15. Seasonal behavior of Minnesota alfalfa prices.



vance month by month. Typically, they reach their peak in about March, just before the spring pasture season begins. This annual movement amounts to about 8 percent of the annual average price.

Recent events

These seasonal analyses cover 1972 and 1973, 2 years of almost unprecedented upheaval in farm prices and the general economy. Economic events in these years included huge Russian grain purchases, dollar devaluations, U.S. price controls, poor crops abroad, export controls on soybeans, inflation, a worldwide energy crisis, and even the protein-rich anchovies' mysterious disappearance from ocean fishing grounds. Do our ideas about seasonal price behavior hold up in such unusual times?

Generally speaking, yes. In 1972, almost exactly two-thirds of both crop and livestock prices fell inside their various zones of irregularity, just as would be expected in an "average" year. In 1973, the picture was less reassuring. Because of the wild behavior in the crop sector,

only 28 percent of 1973 crop prices fell into their respective zones of irregularity. However, half of all 1973 livestock prices remained inside the zones.

Concluding comments

These 15 indexes of average seasonal price behavior cover products which make up 93 percent of Minnesota's cash farm marketings. They show both the average pattern of seasonal price change and the extent of irregularity or variability existing around each average pattern. Most Minnesota farm commodities show noticeable seasonal price patterns. These are linked mainly to seasonal production patterns here and elsewhere. Because the analyses reported here span 10 to 20 years (ending in 1973), these calculations represent latest data. They show that farm price seasonality tends to persist in widely different economic situations—even the current one.

The 15 commodities can be grouped into strong, moderate, and weak seasonal patterns:

Strong seasonal
Manufacturing milk
Fluid milk
Slaughter cows
Oats

Moderate seasonal
Eggs
Corn
Hogs
Potatoes
Hay
Steers and heifers
Calves

Weak seasonal
Turkeys
Soybeans
Wheat
Barley

Buyers and sellers familiar with these price patterns and their regularity over time are likely to be more successful managers. Current market information and short term price forecasts are more valuable to those who understand prices' tendency to rise and fall seasonably. Even in today's world of inflation and uncertainty, such patterns still operate.

Minnesota AGRICULTURAL ECONOMIST

Agricultural Extension Service
University of Minnesota
NO. 561 NOVEMBER 1974

Agricultural Extension Service
Institute of Agriculture
University of Minnesota
St. Paul, Minnesota 55101

Roland H. Abraham, Director

Cooperative Agricultural Extension Work
Acts of May 8 and June 30, 1914

OFFICIAL BUSINESS

Issued in furtherance of cooperative extension work in agriculture and home economics, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Roland H. Abraham, Director of Agricultural Extension Service, University of Minnesota, St. Paul, Minnesota 55101.

John J. Waelti Editor

Prepared by the Agricultural Extension Service and the Department of Agricultural and Applied Economics. Views expressed herein are those of the authors, but not necessarily those of the sponsoring institutions. Address comments or suggestions to Associate Professor John J. Waelti, Department of Agricultural and Applied Economics, University of Minnesota, St. Paul, Minnesota 55101.

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF
AGRICULTURE
AGR 101

THIRD CLASS

