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# Minnesota AGRICULTURE ECONOMIST



## Age of Minnesota Farmers

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Is Minnesota agriculture becoming an industry of the aged? With the large-scale migration of farm people, especially the young, many people are asking this question.

The major purpose of this article is to present information on the age of farm operators in Minnesota. We begin by making comparisons with other U.S. farmers and other self-employed persons. We then concentrate on Minnesota, measuring the extent of age differences of farm operators by county and attempting to identify and measure county characteristics associated with the age of farm operators.

Table 1 shows the age distribution of farm operators in the United States and Minnesota for selected years since 1920. Apparently there has been a longrun upward trend in average age of farm operators both in Minnesota and the nation. But these data reflect the age of only the senior decisionmaker on the farm. In the case of father-son partnerships where the father still is the major decisionmaker, the son's age is not included. Thus, if it

has become more common in recent years for beginning farmers to start with parents or relatives rather than on their own, we would expect a rising average age due to this fact alone. At any rate, these data undoubtedly reflect an upper bound to age of all farm operators.

As shown in table 1, Minnesota has been a state of relatively young farmers compared to the rest of the nation. Moreover, U.S. farmers have increased in age by 2.6 years from 1945 to 1964, while the age of Minnesota farmers has increased only 1.5 years. In other words, the age of Minnesota farmers has increased less rapidly than in other states.

Looking more closely at the table, we note that Minnesota has a larger share of farmers in the 34 and below category and a smaller share in the above 65 group than the rest of the nation. The relative share in the middle group is not greatly different between Minnesota and the country.

The apparent rise in average age both at the state and national levels seems to be due mainly to a large decline in the 25-34 age category. In the most recent census year (1964), this group accounted for almost 10 percent fewer farm operators than it did in 1920.

**Table 1. Age distribution of farm operators, United States and Minnesota**

Year	Age			Average
	34 and under	35-64	65 and over	
		percent		
		<b>United States</b>		
1964	11.5	71.2	17.4	51.3
1959	12.7	70.6	16.8	50.5
1954	15.1	68.3	16.6	49.6
1950	18.9	66.2	14.8	48.3
1945	17.2	67.7	15.0	48.7
1940	20.3	65.6	14.2	NA*
1930	23.4	65.4	11.1	NA
1920	26.9	63.8	9.2	NA
		<b>Minnesota</b>		
1964	14.9	73.4	11.8	48.9
1959	16.5	72.9	10.5	48.1
1954	17.6	70.4	12.1	47.8
1950	20.6	68.8	10.5	46.9
1945	19.1	69.8	11.1	47.4
1940	19.1	69.2	11.9	47.6
1930	20.6	68.9	10.4	NA
1920	26.7	66.7	6.6	NA

\*NA = not available.

Source: U.S. Census of Agriculture, respective years.

**Table 2. Median age of self-employed males, selected industries, 1960**

Industry	Median age
Farming	49.2
Construction	44.5
Manufacturing	48.4
Wholesale	49.0
Restaurants	48.4
Other retail	48.4

Source: Radoje Nibolitch, *A Comparison of Age Levels of Farmers and other Self-Employed Persons*. USDA, ERS Report 126, November 1967.

## FARMERS COMPARED TO SELF-EMPLOYED BUSINESSMEN

The increased amount of capital required on farms and the increased managerial requirements make farmers essentially self-employed businessmen. The data presented in table 2 reveal that median age of farmers compares closely with median age of other self-employed businessmen. The data in this table are median ages, whereas the figures in table 1 are averages. However, these two measures come close together, as a comparison of the average and median<sup>o</sup> ages of farmers given in tables 1 and 2 shows.

## AGE VARIATION WITHIN MINNESOTA

Figure 1 shows the average age of Minnesota farmers grouped into three categories. At first glance, there appears to be little difference from the youngest to the oldest group. However, more variation existed between these groups in 1964 than on a statewide basis over the past 25 years (table 1).

The most striking thing about figure 1 is the definite pattern of age differences. The counties with the youngest farmers are concentrated in the south and west, whereas those with the oldest farmers are largely in the north and east. The middle age group counties form a kind of transition zone running diagonally from southeast to northwest, with the largest concentration in the southeast. Three exceptions are Carlton, Itasca, and Lake Counties. A very similar pattern of age difference existed for 1959 also, with older farm operators located in the northern and northeastern areas of the state.

The pattern of increasing age moving from south to north and west to east suggests that age is highly correlated (negatively) with the extent of commercial agriculture. This relationship is illustrat-

<sup>o</sup> The median is the value of the middle item when the items are arranged according to size, from the smallest to the largest.

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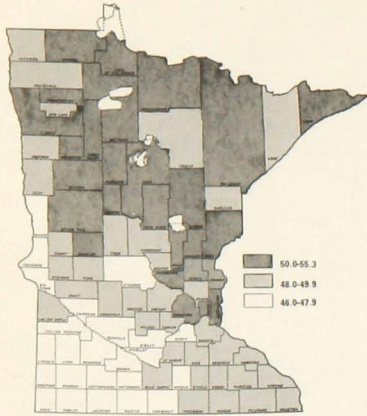


Figure 1. Average age of Minnesota farmers, 1964.

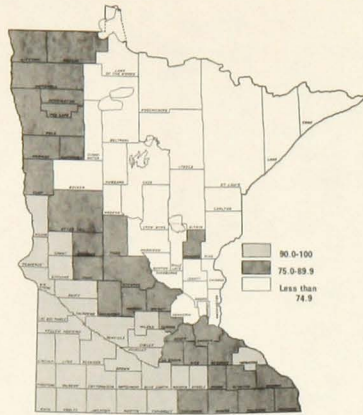


Figure 2. Percentage commercial farms of all farms, 1964.

ed in figure 2, which shows the percentage of all farms in each county that were classified as commercial farms by the 1964 Census. Comparing figures 1 and 2, we note that the counties with the largest percentage of commercial farms also are those in the younger age categories.

As shown in table 3, roughly one-third of the counties in the state fell into each age category in 1964. Yet the counties with the youngest farm operators sold over two times the value of farm products as counties with older operators. Thus, the bulk of farm production in Minnesota is carried on in counties where farm operators average less than 50 years old.

The rising average age of farm operators over time also is apparent in table 3, where fewer counties fell into the 46.0-47.9 group and more into the 50.0-55.3 category with the passage of time. It will be interesting to see if this trend continues with the 1969 Census.

To obtain additional information about the relationship between age and degree of commercial agriculture, we employed a statistical technique known as multiple regression analysis in an attempt to explain the age variation between counties. Using this technique, we found that

about 60 percent of the variation in average age of farm operators between counties was accounted for by the variation in percentage of farms classified as commercial farms.

We utilized several other variables in an attempt to explain the remaining 40 percent of the age variation. Surprisingly, level of education in counties was not correlated with average age of farmers. A second variable not significantly related to age was percentage change in number of farmers between 1959 and 1964. In other words, differences in rate of farm consolidation apparently do not have a significant effect on age of farm operators.

One variable highly correlated with age was the extent of part-time farming as measured by percentage of farmers working 100 days or more off the farm in the census year. Counties with more than the average amount of part-time farming also have older than average farmers. We might expect this relationship from looking at figures 1 and 2, where counties with younger farmers are those with the most commercial agriculture.

Pushing our analysis further, we found that the extent of part-time farming is highly correlated with the percentage of nonfarm population in the county and in the immediate region. If we consider the percentage nonfarm population as a measure of nearby nonfarm employment opportunities, then it appears that where these opportunities exist, farmers do take advantage of them to supplement their incomes. However, we did not find a significant relationship between the percentage change in number of farms and nearby nonfarm employment opportunities, suggesting that these opportunities encourage part-time farming rather than an exit from agriculture altogether. ■

## International Commodity Agreements

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Exports are important to Minnesota agriculture. This year, analysts expect that 3 out of every 10 bushels of soy beans harvested will be exported. About 4 out of every 10 bushels of wheat and 1 1/3 out of every 10 bushels of corn grown also will be exported. Exports, therefore, are a very significant part of total commodity demand. And, just as domestic programs affect markets, developments in international trade programs also have a substantial impact on markets for Minnesota agriculture. International commodity agreements have been one important trade development.

In the past couple years, a new international wheat agreement and consideration of an international oilseeds agreement have been reported. These agreements relate to major Minnesota commodities. This article considers the major types of commodity pacts and their purposes.

International commodity agreements are negotiated between groups of countries that often include both exporters and importers. Generally, they aim to stabilize prices, supplies, and trade and may aim to raise prices.

International commodity agreements date back at least to 1902 and the Brussels Sugar Convention, which was an agreement among European countries and involved the sugar trade.

International commodity agreements are now in force for wheat, sugar, coffee, tin, and olive oil. Over the years, agreements also have included beef, rubber, timber, wool, and tea — none of which is now in force.

### PURPOSES OF AGREEMENTS

There are two basic objectives for these agreements. One objective is to influence world market prices. The other is to influence flow of commodities in international trade.<sup>1</sup>

The first objective is appealing from several points of view. The demand for agricultural commodities tends to be quite inelastic. Hence, prices are driven down in years of high production and soar in years of low production. Even though prices might tend to average at a reasonable level, extremely low prices in any one year could be disastrous for some export industries and economies. Conversely, extremely high prices in any one year could be damaging to some im-

Table 3. Value of farm products sold, Minnesota, 1959 and 1964, based on counties classified by average age of operator

Age	Number of counties		Value of farm products sold, million dollars	
	1959	1964	1959	1964
46.0-47.9	39	26	407	364
48.0-49.9	27	33	178	320
50.0-55.3	21	28	100	176

Source: U.S. Census of Agriculture, respective years.

<sup>1</sup> Krumme, Robert D. "International Commodity Agreements: Purpose, Policy, and Procedure," *George Washington Law Review*, Apr. 1963, pp. 789-811.



port industries and economies. Price stabilization may, therefore, appear advantageous to both exporters and importers.

From the point of view of economic planners, public or private, predictable price levels may be highly desirable. If a planner or manager is considering investments in agriculture, it is much easier to evaluate alternatives if output price is relatively certain. Similarly, it is easier for an importer to make plans if input price does not fluctuate widely.

Engaging in commodity agreements to raise price also can be an appealing prospect. Often, exporting nations become interested in commodity agreements following periods of low export prices. To be effective, an agreement requires sufficient exporter participation to achieve monopoly power and/or purchasing agreement by importers to take pressure from the target price.

A second international commodity agreement objective is to influence commodity flows. Maintaining commodity flows is particularly useful for economic planning. First, consider the perspective of the exporting nation. Many agricultural investments require massive expenditures (and some years) before payoff. It may be difficult to make these payments unless there is some certainty of eventual commodity flow. An exporting country also must make substantial investments in export facilities. There are obvious efficiencies if this investment can be tailored to anticipated commodity flows. Furthermore, planable exports mean planable foreign exchange earnings needed to buy imports and foster development.

This objective also arises from the point of view of the importing nation. Planning is easier if flows of necessary inputs are predictable. It becomes possible to plan more efficient import facilities — docks, harbors, etc. It also enables managers to consider using the imported commodity more precisely.

Clearly, both the price and commodity flow objectives have particular appeal for lesser developed countries. Where economic growth is just beginning, severe price reversals can be devastating. Where capital is very short, efficient use is essential. Where export/import trade is

at a precarious balance, predictability of product flows may help expand trade.

For other nations, there also are advantages to less uncertain price gyrations and commodity flows. These advantages appear to both public planners and private business managers. Thus, pressure is generated for stabilizing international commodity agreements.

### TYPES OF AGREEMENTS

Of the many agreements and negotiations since 1900, three major types have emerged: the export quota, the buffer stock, and the multilateral contract.<sup>2</sup>

#### Export Quota

In this type of agreement, target price or price range is negotiated by the participants. A system of export quotas is then established for exporters so that world export supplies do not become so great as to push price below the negotiated level. Clearly, all major exporters must be parties to the agreement in order to provide effective control over export supplies. Importers can help by buying only from participants.

The International Sugar Agreement relies chiefly on export quotas to maintain prices. The purpose of the first sugar agreement (the Brussels Sugar Convention) was to raise depressed export prices for sugar producers. Early attempts failed, chiefly because some large producing nations were outside the agreement.

Quotas were subscribed to by member exporters, but the exporters outside the agreement offered to sell to importers at a lower price than the agreement minimum. And importers expanded domestic production. Hence, importers' needs were filled and the desired impact on price was not achieved.

Subsequently, organization efforts aimed at including more exporting and importing nations in the agreement were initiated. The 1937 agreement included nations comprising 75 percent of the world sugar trade. It encompassed 18 exporters and 4 importers. Yet it failed to raise prices to a satisfactory level.<sup>3</sup>

Sugar agreements signed in the fifties and sixties strove to compensate for some earlier problems. They attempted to regulate exports more closely, to limit importers' purchases from nonagreement countries, and to expand consumption. Another important feature was provision for adjustments in response to changing economic conditions; i.e., the agreements provide for renegotiation of key clauses on price and quotas if difficulties appear.

In practice, a very useful part of the Sugar Agreement has been the International Sugar Council. Comprised of representatives of member nations, it provides a forum for continuing communication. By this means, some potential trade difficulties may be foreseen and avoided by appropriate policy decisions.

#### Buffer Stock

A second method of implementing international commodity agreements is with a buffer stock mechanism. Nations trading a particular commodity come together and negotiate a desired price range or commodity flow. The buffer stock acts as a reservoir. When price is too low or commodity flow is too great, supplies are diverted from the market into the buffer stock. If prices become too high or flow is too small, supplies are drawn from the stock into the market.

An example of an agreement implemented through a buffer stock mechanism — the International Tin Agreement — is outside agriculture. Some form of international tin agreement has been operating occasionally since 1921. Agreements generally have not been in force during war years or other periods of extreme international instability.

The tin agreement has included about 93 percent of world production and 37 percent of consumption, excluding mainland China and the Soviet Union. These exclusions have been important. In some years, nonmember countries have been major exporters, resulting in lower than desired world prices. For example, export sales by the Soviet Union were substantial in 1958, contributing to a sharp reduction in tin import prices throughout the world.

The agreement is operated by the International Tin Council. A floor price and a ceiling price are set by the Council. The management must buy tin if the price goes below the floor and it has funds. It must sell tin if the price goes above the ceiling and it has tin. The management may buy if price is in the lower third of the range. It may sell if price is in the upper third of the range. In both cases the option is to enable moderation of a rapidly fluctuating market. Producing countries are required to contribute to the buffer stock. There is provision for doing so in both tin and cash.

The tin buffer stock is geared primarily to moderating short term price fluctuations. The agreement has another mechanism for dealing with long term market problems. It provides for export controls on producing countries to alleviate price-dispressing problems that appear to have

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<sup>2</sup> Hudson, S. C. "The Role of Commodity Agreements in International Trade," *J. Ag. Econ.*, Vol. XIV, No. 4, Dec. 1961.

<sup>3</sup> *Ibid.*

long term prospects. It also provides for assistance toward maximum rate of development and equitable supply distribution in case of prospective long term shortage.

In the long run, the cost of maintaining a buffer stock against major downward price movements would be enormous. Longrun maintenance against upward price movement would be impossible. Export and production controls aim to relieve longrun pressures.

### Multilateral Contract

This type of commodity agreement involves both importing and exporting nations. Importing members of the agreement agree to take at least a specified proportion of their imports from exporter members. Exporting members agree to supply at least a specified quantity to importer members.

A most critical part of this type of agreement is negotiation of a minimum and maximum trading price. The importer's agreement requires that he buy a specified quantity from exporting members at the minimum price, even if price is lower elsewhere. The exporter's agreement requires him to sell a specified quantity to importing members at the maximum price, even if price is higher elsewhere.

The International Wheat Agreements have been multilateral contract agreements. The first International Wheat Agreement was negotiated in 1933. It was a quota agreement. It collapsed in the first year when one exporter exceeded his quota.<sup>4</sup>

After World War II, there was further discussion that led to an agreement reached in 1949. It was a multilateral contract agreement including both importers and exporters. A prime objective was to alleviate problems caused by both burdensome export surpluses and critical wheat shortages.

Some form of wheat trade agreement has been in force ever since. Basically, these agreements have been 3-year ex-

tensions of the 1949 pact. More thorough renegotiation became a part of the Kennedy Round of negotiations of the General Agreement on Trade and Tariffs. This agreement led to a substantially modified wheat provision in the International Grains Arrangement.

Just like the sugar and tin agreements, the International Wheat Agreements have been administered by a council. It oversees administration and provides a forum for discussion. It also performs important functions in data collection and distribution.

Major problems have arisen when wheat in export markets trades near the minimum and maximum of the range. When price is at the maximum, an exporter feels great pressure to avoid the agreement and sell elsewhere above the maximum agreement price. When price is at the minimum, the importer feels pressure to buy elsewhere at a lower price.

### COMMODITY AGREEMENT PROBLEMS

Despite the apparent appeal of international commodity agreements, their use has been rather limited. Several problems tend to develop.

One problem is associated with the sheer complexity of most agreements. There usually is specification of price ranges, shipment and purchase requirements, negotiating procedures, etc. The price specification can be enormously difficult. With a commodity such as wheat, there are many different grades and export points. A meaningful price specification must include a schedule for all qualities, which is further complicated because exporting nations have different grading systems. Further, it must apply to all export and import points, which requires computation of proper shipping cost differentials that may vary seasonally.

Another problem is associated with the specified price range. If it is too low, it can be a price-depressing factor for the market.

More often, the objective of an agreement is to raise prices. If the price range is relatively high, it can be an incentive to induce production and export competition from presently nonexporting countries. Furthermore, persistently high prices encourage synthetics and substitutes. International commodity agreements often have failed because of an excessive specified price range. Exporters who have banded together to raise prices often have faced declining markets as others increased their production of the commodity and/or substitutes and synthetics.

Minimum price maintenance in the face of expanding supply is most difficult. It also is difficult to maintain import guarantee requirements in the face of lower priced imports outside the agreement.

Like most other forms of market control, international commodity agreements are effective only if the group has a perfect monopoly or complete collusion. Competition from other exporters and substitutes can undermine the monopoly if price is excessive. If different countries within the agreement have substantially different commodity production costs, there may be real competition generated from within when low cost producers endeavor to increase sales.

Inflexibility itself can be a problem. New technologies may change relative production costs. As industries develop, import requirements may shift. Port facilities and shipping technology may alter relative competitive export positions. These and other factors require flexible prices and markets. Even if there is provision for renegotiation of key agreement terms, such change comes **after** the pressure for change.

Because of the problems, many agreements have been relatively short-lived. Others are only partially operating. Those that have persisted have been subject to frequent renegotiation, have included most of the trade, and have included some clear benefits for buyers and sellers. ■

<sup>4</sup> Ibid.

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