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James Rude  
Iowa State University

Steven L. Elmore  
Iowa State University

Darnell B. Smith  
Iowa State University

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Grains and Oilseed Cropland: A Global Perspective
James Rude (515-294-6183)
Steven L. Elmore (515-294-6175)
Darnell B. Smith (515-294-2390)

Current tight grain markets have led some commentators to argue that the world is entering a phase of rising food scarcity. The present situation is related to the rise in world consumption, which has tended to outpace production during the 1990s. While most supply shortages were due to weather shocks, the global area planted to grains has decreased from 1,784 million acres in 1980 to 1,718 million acres in 1996 (USDA). The question remains, “Are there enough land resources available globally to meet future production needs?” The combined grains and oilseeds area has, however, increased over that same period.

International
The decline in global grains area over the past 15 years can be primarily explained by two factors: a substitution of land resources to oilseed production, and government programs that idled land. Figure 1 illustrates that since 1980, additions to total arable area have diminished from an annual growth rate of 1.2 percent in the period between 1970 and 1980 to an annual growth rate of 0.3 percent between 1980 and 1990. With total land area effectively constant, expanding oilseeds area has come at the expense of grains area.

One explanation of the increase in oilseeds area is that producers have shifted area planted to these crops to avoid the uncertainties associated with the ongoing subsidy war that has affected international grain markets (primarily wheat) but has only had a minor impact on oilseeds trade. Other explanations of the shift to oilseeds area include rotational considerations and, perhaps most importantly, continued strong growth in demand for oil and protein meal products combined with low oilseed yield growth. Whatever the cause of the shift in cropping patterns from grains to oilseeds, the production of grains has not declined as a result of the reallocation of the land resource. Figure 2 illustrates the continued growth in grains production. The reason for continued growth in production is yield growth. Figure 3 demonstrates that grains yields have been growing more rapidly than oilseeds yields. Between 1980 and 1996, yields for grain grew at an annual rate of 1.6 percent and oilseeds yields grew by less than 1 percent.

Government land diversion programs, although important locally, have had only a minor effect on global arable area. In 1991, government-sponsored idled land accounted for about 3 percent of total global grains and oilseeds area. By 1996, idled land accounted for only 1.6 percent of the total area. In the United States, the FAIR act has removed all land set-aside, with the exception of CRP and Wetlands Conservation. The European Union has reduced its set-aside from 15 percent of base area to 5 percent in 1997.

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Although world grains area has declined over the past 16 years, most of this land could be induced back into grains production—but at the cost of higher prices relative to oilseeds markets. Even if all the land in government set-aside programs is returned to production, the total effect on grains area will be minimal.

Any assessment of future grains markets requires an examination of China. Some commentators have expressed concern that China may not be able to feed its population because of a loss of agricultural land and growing demand.

Total cropland in China is generally thought to be underestimated. Most of the unreported land is reclaimed land that has not been included in official statistics because farmers and local governments find it in their interest not to report this land. While the Chinese State Statistical Bureau (SSB) reports 237 million acres of land in crop production, the Land Administration census suggests that this figure should be 306 million acres. Taking reclaimed land into consideration, the net loss is only 11 million acres. The effects of decreased area are further offset by increased multiple cropping during a year. After accounting for increased multiple cropping, the net loss in area is only 3 million acres. Furthermore, only a fraction of this land is lost to non-farming purposes. Most of the land has been diverted to inland fishery production, reforestation, and crops such as vegetables and tree fruits.

Other developing countries and economies in transition also have reserves of land that could be brought into crop production. In its document, “Agriculture: Towards 2010,” the Food and Agriculture Organization of the United Nations estimates that potential land exceeds land in use by 4.5 billion acres in developing countries and in 1996, Russia and Ukraine, alone, planted area was 16 percent (29 million acres) less than in 1987.

U.S. and Iowa

Agricultural land use in the United States has changed under the past farm bill programs. Under the new farm bill, only the long-term land retirement programs remain (Conservation Reserve and Wetlands Reserve); the yearly set-asides are gone. Historically, the United States reached peak harvested grain and oilseeds area in 1981 at 277 million acres (Figure 4). Harvested area combined with idled area peaked in 1983 at 297 million acres (partly due to high slippage in the payment-in-land program), and in 1996 it was 277 million acres. Harvested area has risen to 242 million acres, the highest level since the late 1980s.

In Iowa, planted area has continued to increase and is at its highest level (22.6 million acres) since 1984/86, when over 23 million acres were planted (Figure 5). Corn area in Iowa has remained relatively constant, changing mainly with USDA yearly program set-asides. Oat area has continued modest declines while a strong trend has developed in soybean area.

In 1970 soybean area was 5.7 million acres (30 percent of total planted area), 7 million acres in 1973, and grew to 8 million acres in 1979. In 1995/96 soybean area broke the 9 million acre mark, and, in 1996, 9.5 million acres were planted (42 percent of total planted area). This shift from grains to oilseeds follows the global pattern discussed earlier in this article.

Conclusions

The major cause of a decline in world grains area has been a shift to oilseeds. Yield growth has been sufficient to compensate for the loss of grains area harvested. Although, with current low stockholding levels, periodic shortages can be expected; the potential for chronic future food shortages is (continued on page 14)
ameliorned by a significant reserve of potential arable land and yield growth potential. While some land—in the United States and the world at large—has been lost to government set-aside and to urbanization, the loss of this land is minor in comparison to total area. The loss of land does have consequences for the distribution of land qualities. If better quality land may be lost to long-run retirement and urban development, more environmentally sensitive and poorer quality land may have to be brought into production.

EMERGING ISSUES

Transportation Changes Increase Risks for Country Elevators
C. Phillip Baumel, Charles F. Curtiss Distinguished Professor of Agriculture, Iowa State University (515-294-6263)

Introduction
Farmers face increasing price and output risk. The increased price risk stems from the reduction in and eventual elimination of flexible government payments, increased volatility in grain purchases by importing countries and virtual worldwide elimination of grain reserves. Increased output risk comes from changing weather patterns and elimination of government constraints on acres planted in certain crops.

Country elevators face these same forces which increase their price and transportation risks. Country elevators are able to reduce their exposure to price risks by hedging their grain purchases on the Chicago Board of Trade. Hedging eliminates the risk from the volatility of world grain markets, but subjects the hedger to the less volatile “basis” risks. However, country elevators have no similar mechanism to protect themselves from the transportation risks arising from volatile changes in export sales and in grain production levels.

Rail-Car Shortages
Railroad grain-car shortages have plagued the grain industry for over 100 years. Since the early 1970s, the basic cause of grain-car shortages has been dramatic increases in grain export demand over short delivery periods. The most recent grain-car shortage problems were in late 1995 and early 1996. U.S. farmers harvested a huge 10.1 billion bushel corn crop in the fall of 1994. Grain exports were up 33 percent in 1995 over 1994; rail shipments to export ports were up 73 percent and barge shipments were up 25 percent. Despite these major increases in both rail and barge shipments to export ports, grain shippers wanted to ship even larger quantities during the last half of 1995 and the first half of 1996.

A huge increase in the demand for grain transport results in dramatic increases in barge rates. For example, in the fall of 1995, barge rates from McGregor, Iowa, increased almost 33 cents per bushel—more than double their rates prior to the increase in exports. While railroad rates also increased, the total cost of shipping by barge to New Orleans exceeded the cost of shipping by rail. These huge increases in barge rates and as well as barge shortages sent grain shippers rushing to the telephone to order large numbers of rail cars, and grain-car shortages followed. The Upper Mississippi River was frozen during the winter and railroads were expected to carry both the railroad and barge shares of grain exports.

Railroad efforts to increase rail car efficiency have created changes in the manner in which railroads operate. Railroads have initiated shuttle trains, car pools, reduced loading and unloading times, and 100-car train rates. These larger trains are committed and distributed to shippers who made prior commitments to the railroad. The result is that fewer rail cars are available to shippers who have not made prior commitments.

Almost all the new cars purchased since 1988 have been heavier and larger than the standard 263,000 pound gross weight cars. Approximately 25 percent of the entire grain-car fleet has 286,000 pound gross weight limits. These heavier cars cannot be used on most branch lines unless the lines are upgraded, or the cars are light-loaded to 263,000 gross weight. With the current emphasis on rail-car efficiency, these cars are not likely to be light-loaded and, therefore, are likely to be used only for mainline service. Assuming all future orders are for heavy cars, the share of cars available to branch line elevators will continue to decline.

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