

Millet: Background on the Feasibility of Insurance

Millet is a small-seeded annual crop grown for grain and forage. "Pearl millet" is an important food crop in Africa. In contrast, the grain millet grown in the United States is primarily "proso millet," and it is used mainly for birdseed. A small amount of grain millet, reportedly 10-15 percent, is used as a mushroom-growing medium in California. Some millet is also used for human-edible consumption in products such as multi-grain breads and breakfast cereals. Millet can also be harvested as a hay crop in the Great Plains.

The U.S. generally exports 15-20 percent of its annual millet production, to over 70 countries. The top four export markets for U.S. proso millet are the Netherlands, Canada, Japan, and the United Kingdom. Argentina is a major U.S. competitor.

The 1987 Census of Agriculture reported 2,573 farms growing 291,845 acres of proso millet in the U.S, yielding 8,182,568 bushels of grain. Ninety-six percent of the U.S. millet acreage, and 97 percent of the production, were located in North Dakota, South Dakota, Nebraska, and Colorado. The average value of the U.S. crop is estimated to be in the range of \$15-\$20 million dollars. Census data are attached providing county-level detail on 1992 acreage and production for selected states. Census data for 1987, at the state level, are also attached.

Millet in the Great Plains is planted in the spring (usually during June) and harvested in the fall. It is grown in rotation with wheat, using the same tillage, planting, and harvesting equipment that farmers use for wheat. Farmers can plant millet as a fill-in (or "catch") crop on land to which their winter wheat crop, for one reason or another, was a failure. Reportedly, millet leaves the soil loose and relatively free of weeds, and provides a good residue cover.

Harvesting millet involves cutting and windrowing the plant for a period of additional drying. Then, the millet is picked up with a combine and thrashed.

Great variability exists in millet prices from year to year. Reportedly, 80 percent of millet sales occur at between 4 and 5 cents a pound. During market gluts, however, prices can fall to as low as 3 cents a pound, and seldom exceed 10 cents. During early 1994, however, prices approached 20 cents a pound in reaction to increased demand and several years of declining production.

Millet can be stored for up to several years. Some farmers grow millet every year as part of their farm rotations, and sell only when market prices reach or exceed their reservation (minimum selling) price.

Millet can be substituted for corn in some livestock feeds, but its price needs to fall to 2- to 3-cents a pound to economically compete with corn. Market prices generally do not fall this low.

Production Perils

The most significant production perils are hail, drought, wind, early freeze, and heavy rains. Other lesser problems include grasshoppers and onion thrips. Millet is fairly disease resistant.

Heavy rains following planting can crust the soil and prevent germinating seed from emerging, resulting in a poor stand. When this happens, the grower must decide whether to live with a reduced yield because of the poor stand or to replant and risk losing the crop due to freezing weather in the fall before the millet is mature.

Hail can cause serious losses, particularly if the seed heads have developed. Various contacts reported quite different viewpoints, however, on how serious hail was as a source of yield loss.

Early freezes can cause serious yield losses, especially for late-planted millet. The optimum planting time in the four major states is early- to mid-June. Millet planted after mid-June is more likely to not have ripened by the time the first freeze occurs in the fall and, therefore, is more likely to suffer yield losses. Late-planted millet also generally yields less, even without freeze damage, than that planted earlier.

Wind damage occurs when high winds shatter (thrash) the ripened millet before it is harvested. Millet has a short window of opportunity between when the grain has ripened enough to harvest and when the seed heads are subject to shattering.

Drought is a problem when there is not enough moisture for germination of the seed. It reportedly takes only about 1 inch of rain, if well-distributed over the season, to produce a millet crop. If there is not enough soil moisture at planting time, however, seed germination will be delayed (or reduced), and yields will suffer.

Ad Hoc Disaster Assistance

Ad hoc disaster assistance data indicate \$11.3 million in payments for millet yield losses over the 1988-93 period. Payments were made in a total of 25 states (Figure 1.) Thirteen of those states received payments in each of the six years. South Dakota received the largest in payments over the six-year period, at \$5.6 million, followed by North Dakota (\$2.2 million), Colorado (\$1.4 million), and Nebraska (\$1.2 million).

On the county level, the top ten recipient counties received about 45 percent of total disaster payments over the 1988-93 period. Of those counties, two were in North Dakota, one was in South Dakota, and seven were in South Dakota. The top-three ranked counties were Sargent County, North Dakota (\$779,000); Dickey County, North Dakota; and Cheyenne County, Nebraska (\$656,000).

As shown in Table 1, the Dakotas collected a relatively large share of ad hoc payments relative to their harvested acreage. South Dakota accounted for about 26 percent of U.S. harvested millet acreage in

1987, and collected about 51 percent of ad hoc payments between 1988 and 1993. In contrast, Colorado accounted for 31 percent of U.S. millet area, but only 12 percent of ad hoc payments.

Insurance Issues

One contact indicated that he thought that a moral hazard problem could arise during seasons of low market prices if grower returns from harvesting a crop were lower than the return they would earn from a crop insurance indemnity payment. This person felt that, by not harvesting on a timely basis, a grower could materially increase the chances of yield loss due to wind shattering, and thereby increase returns by collecting an insurance indemnity.

A second insurance issue is timeliness of planting. Early- to mid-June is the optimum time for planting in most areas. Planting later than this date increases the chances of yield loss due to an early fall freeze. Some growers may let crop insurance bear the risks associated with late planting, and plant after the normally prudent planting dates for their area, thereby increasing the chances of yield loss due to early fall freezes.

Table 1--Millet Harvested Area and Ad Hoc Payments

State	1987 Harvested Acres	1987 Share of Total Acres	1988-93 Total Ad Hoc Payments	1988-93 Share of Total Ad Hoc Payments
	Acres	Percent	1,000 Dollars	Percent
Colorado	90,529	31.0	1,358	12.4
Kansas	8,184	2.8	69	0.6
Nebraska	70,866	24.3	1,221	11.1
North Dakota	42,165	14.5	2,225	20.3
South Dakota	75,465	25.9	5,647	51.4
U.S.	291,845	100.0	10,797	100.0

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