USE OF CROP DRYERS IN TWO AREAS OF NORTH DAKOTA

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Crop dryers are increasingly being purchased by operators of large farms to dry sunflowers and small grains. Dryer owners dried 36 per cent of their durum and 58 per cent of their sunflowers in a typical year. Purchases were made largely as a means of reducing the risk of crop losses from adverse weather.

Artificial crop drying has become increasingly important to North Dakota farmers as an alternative to natural drying of crops during harvest. The addition of sunflower as a production alternative has prompted many farmers to purchase drying equipment for that crop. Other crops commonly dried in the state include corn, wheat, and barley. A 1977 survey of dryer owners provided information concerning drying experience, reasons for dryer purchase, crops typically dried, and volumes of grain dried annually. Dryer owners' notions of the benefits of grain drying also were found.

Data were obtained from a random sample of 60 dryer owners in two areas of North Dakota (Figure 1). The primary crops grown by farmers in the northeast area were durum, barley, and spring wheat. Farmers in the east-central area raised mainly spring wheat, barley, and sunflowers.

Type and Use of Dryers

Farmers owning grain dryers operated much larger than average-sized farms. Farm acreage of survey farmers averaged 2,090 acres; while the *1974 Agricultural Census* indicated an average farm size of 867 acres in the counties surveyed. Rented acreage among dryer owners accounted for 44.7 per cent of total farm acreage and was nearly three times greater than the average for the area.

The most popular type of dryer was the recirculating batch system (Table 1). The continuous flow dryer was the second most prevalent dryer type. Batch-in-bin, automatic batch, and continuous flow-in-bin dryers were used by proportionately few farmers in the sample. Fifteen per cent of the farmers interviewed had a different dryer prior to the purchase of their current dryer. These repeat purchasers of dryers were more common in the northeast region than in the east-central region.

Dryer ownership among survey farmers averaged 5.67 years (Table 2). Dryer owners in the northeast had significantly more drying experience than did those in the east-central area. Presumably this difference is due to differing reasons for dryer ownership between the two regions.

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Figure 1. Counties Surveyed and Number of Farmers Interviewed Per County

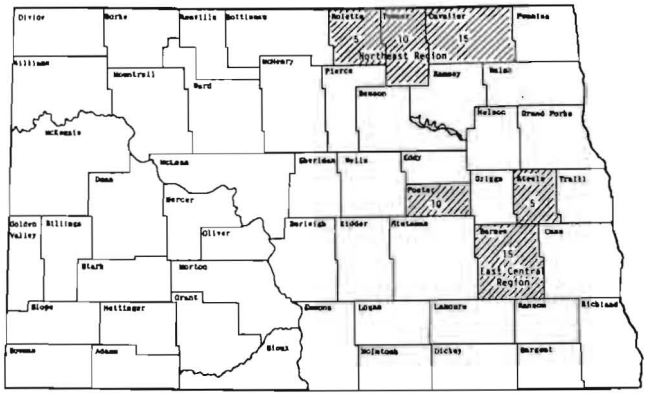

Table 1. Type of dryer used by farmers surveyed, North Dakota, 1977

Type of Dryer	East-Central Area	Northeast Area	Total
Recirculating Batch	15	24	39
Continuous Flow	9	3	12
Batch-in-Bin	4	1	5
Automatic Batch	0	2	2
Continuous Flow-in-Bin	2	0	2

Table 2. Crop drying experience of farmers surveyed, North Dakota, 1977

Area	Average Years Dryer Owned
Northeast	7.33
East-Central	4.00
Combined	5.67

Many factors contributed to dryer purchases by survey farmers (Table 3). The most frequent reason given in the east-central area was for sunflower production. Many dryers were purchased in both areas in an abnormally wet year to save deteriorating grain. Farmers in the northeast region were very concerned with the shortness of the harvest season. Thus, many dryers were purchased to enable more efficient use of available harvesting time. Durum growers in the northeast area purchased dryers to help insure timely harvest of top quality durum wheat.

Table 3. Factors contributing to dryer purchases by farmers surveyed, North Dakota, 1977

Factor	East-Central Area	Northeast Area
	(number of farmers citing factor)	
Too Wet to Combine That Year	11	19
Season Is Normally Too Short to Get Harvest Done on Time	9	20
Needed for Sunflower Production	22	0
Quality and Quantity Savings of Grain	1	10
Needed for Straight Combining	6	0
Elevator Cannot Handle the Volume of Custom Drying	1	4
Other Reasons	2	4

The most common crops dried by survey farmers were spring wheat, durum, barley, and sunflower. Findings indicated that some small grain was dried by most farmers in a typical year, but the volume of grain dried was relatively small compared to the volume harvested (Table 4). This is explained by the fact that many dryers were purchased only for use in emergencies and in short harvest seasons. Thus, in the average year, the weather conditions would not necessitate dryer use, except on those occasions when the timeliness of harvest was jeopardized.

Sunflower was typically raised only by farmers in the east-central area. A much greater percentage of sunflower was dried than any other crop produced. Sunflower drying was a major factor in dryer purchases by sunflower producers, but 63 per cent of those producers indicated that they would have purchased a dryer even if they were not raising sunflower. Apparently these farmers realized a value from drying small grain crops as well as sunflower.

Drying Benefits

Benefits from artificial crop drying depend on the timeliness of harvest as influenced by the weather conditions during the harvest season. Harvest time weather conditions vary from year to year; but during abnormally short or wet harvest seasons, crop drying has the greatest potential to increase revenue by decreasing weather-related crop losses.

Savings from crop drying apply both to small grains and to sunflower. Sunflower typically require some drying nearly every year, but small grains are less dependent on artificial drying to attain safe moisture levels. Therefore, the question of drying benefits for small grains was examined.

Harvesting grain damp and artificially drying reduces potential losses in grain quality and quantity. Quality savings are especially important for hard amber durum due to the price advantage of hard amber durum over lower grades. Artificial drying increases yields of small grains because of less shattering and reduces weight loss due to leaching by rain or excessive natural drying. In years of wet harvest weather, crop drying may reduce or eliminate losses from sprout damage and the inability to pick up the grain. Most survey farmers were unable to put a dollar value on these savings.

The expected number of suitable days for harvesting can be increased by artificial grain drying. Farmers' estimates of time savings in small grains were obtained for three categories: (1) the time gained by starting harvest earlier in the season, (2) the time gained by continuing harvest soon after a rain, and (3) the time gained by starting combining earlier in the morning and continuing later in the evening. Findings revealed that many farmers typically saved time in one or two categories but not in the other(s) (Table 5).

Table 4. Annual frequency and percentage of crop dried by survey farmers in a typical year, North Dakota, 1977 survey

Area	Per Cent of Farmers Drying Crop	Per Cent of Crop Dried
	Spring Wheat	
Northeast	92	19
East-Central	86	24
Combined	88	22
	Durum Wheat	
Northeast	100	38
East-Central	80	31
Combined	93	36
	Barley	
Northeast	85	20
East-Central	19	4
Combined	52	12
	Sunflower	
Northeast	0	0
East-Central	96	58

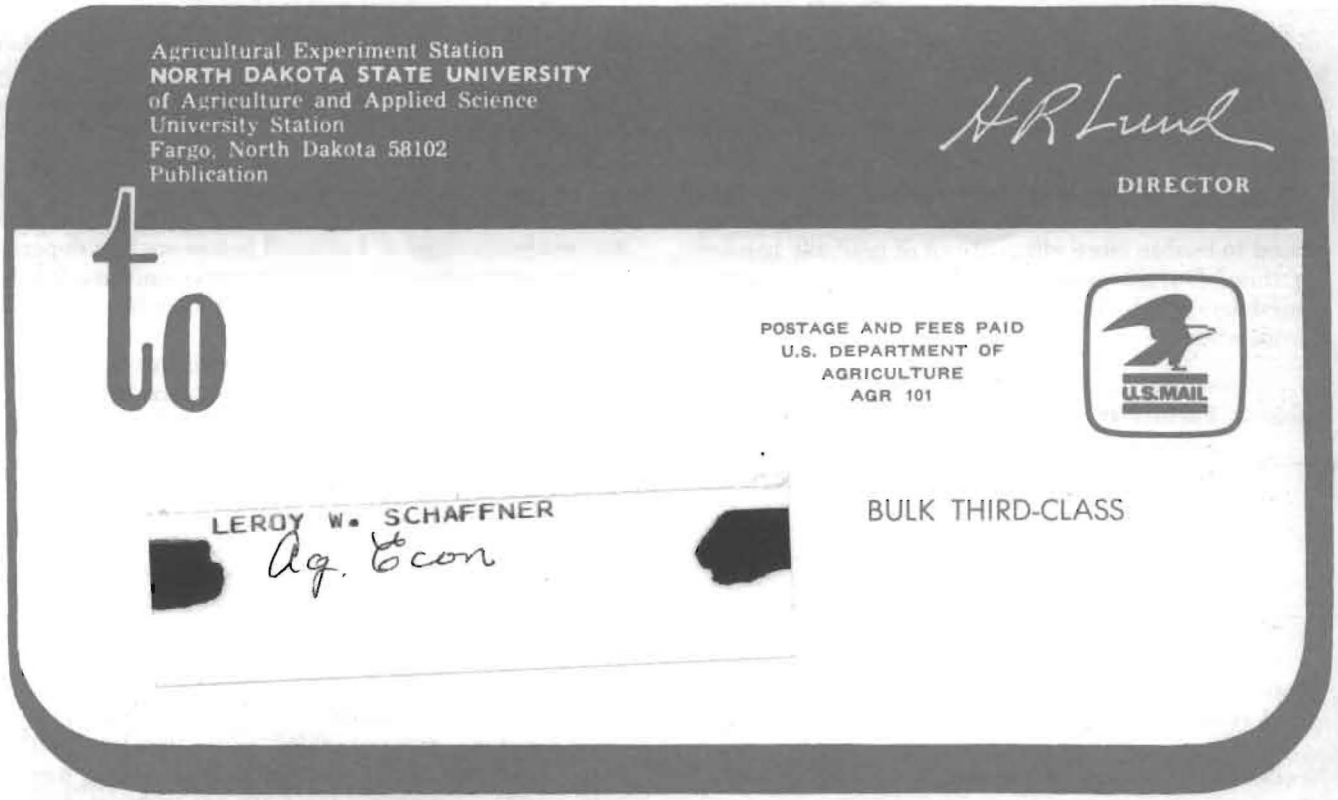

Table 5. Time savings resulting from drying small grain crops by survey farmers, North Dakota, 1977 survey

Area	Per Cent of Farmers Who Realized Savings		
	Earlier Harvest	Soon After Rain	Longer Day
Northeast	50	87	57
East-Central	37	90	73
Combined	43	88	65

Farmers were not able to give very precise estimates of the magnitude of the gains in harvest time due to the use of their dryer. The estimates presented in Table 6 are the farmers' rough estimates of actual time saved. These figures may overestimate actual savings since those farmers who did not venture an estimate tended to be the ones who thought the time savings were minimal.

Many survey farmers regarded dryer ownership as insurance against an adverse season. Investment in a crop dryer is a way of reducing the effects of weather uncertainty and enables the farmer to assure himself greater stability of income over time. With a crop dryer, the farmer decreases the chance of incurring a large loss in one year. The risk reduction aspect often motivates a dryer investment even though the reduction in grain losses over a period of years may not offset the cost of dryer ownership.

Summary

Artificial crop drying during harvest is becoming an accepted practice due to increasing sunflower production and harvest timeliness to achieve optimum yields and quality grain. Survey data indicate that dryer owners dry some crops nearly every year, but the percentage of the total crop dried is relatively small, except for sunflower. Estimates of harvest season time savings plus reports to reduced field losses indicate that considerable benefits from drying exist for farmers in the state. However, reducing risk appears to be the prime motivation for dryer purchase.

Table 6. Amount of time saved for small grain crops due to artificial grain drying, North Dakota, 1977 survey

Area	Farmers Responding	Average Days Saved Per Farmer Per Year
——— Start Harvest Earlier in the Season ———		
Northeast	14	2.5
East-Central	11	2.3
Combined	25	2.4
——— Combine Soon After a Rain ———		
Northeast	22	4.7
East-Central	27	3.5
Combined	49	4.0
——— Work a Longer Harvest Day* ———		
Northeast	15	2.8
East-Central	22	2.7
Combined	37	2.7

**Ten hours per day were used to convert hours to days for this statistic.*