

## **Range, Wildlife and Fisheries Management**

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# **MANAGEMENT OF WASTE CORN FOR WATERFOWL WINTERING ON THE TEXAS HIGH PLAINS<sup>1</sup>**

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Ask Texas sportsmen where the best duck hunting is in the state and they're sure to reply, "the Texas Coast." Few hunters know that the 19,000 or so playa lakes on the Texas High Plains support one of the largest concentrations of wintering ducks in North America, which results in some of the finest duck hunting anywhere. Indeed, if September and October rains fill the playas, the High Plains often attracts more than 1 million wintering ducks. This region also is among the most intensively cultivated areas in the Western Hemisphere, a situation that has brought ducks and man together.

Most of the ducks on the High Plains are associated with the central tier of counties (Castro, Lamb, Swisher, Parmer, Deaf Smith) where irrigated corn is a principal crop. Waterfowl leave playa lakes to feed on waste grain remaining after the cornfields are harvested. Corn is rich in energy and quickly

satisfies many nutritional requirements of ducks during winter.

This field-feeding behavior prompted the Department of Range and Wildlife Management at Texas Tech University to initiate major studies of wintering ducks on the Texas High Plains. Duck hunting can provide an attractive opportunity for local landowners to develop a fee-lease hunting system that could substantially supplement agricultural incomes. For example, many duck hunting leases on the Texas Coast cost in excess of \$100/day and some have exceeded \$10,000 during a season! This report tells you how to manage waste corn to attract ducks for hunting.

This research was reported by the U.S.D.A. Forest Service, through the Great Plains Wildlife Research Laboratory, formerly located at Texas Tech. We thank the many landowners in Castro County for access to their property.

### **How Much Corn is Lost During Harvest?**

Farmers have always known that some corn is lost during normal harvest operations, but estimating this loss has been largely guess-work. We sampled 81 cornfields following standard harvest operations and found the average amount of corn lost was 305 to 345 pounds per acre. Farmers lost an average of 3.7% of the potential yield, with only six fields losing more than 10%. The "record" loss for a field was 2500 pounds per acre, but this field had been damaged by hail prior to harvest. We also found that moisture content of corn at harvest was the key factor affecting the amount of lost corn. For example, fields harvested at 14% to 21% moisture lost more than twice the corn as those harvested at 22% to 26% or 27% to 32% moisture. High moisture occurs early in

the harvest period and decreases with drying through the normal harvest period.

This loss/moisture relationship was plotted and an equation was developed that can predict the amount of corn that will be lost during a harvest. The formula:

$$\text{Amount of corn lost} = 1377 - 48(\% \text{ M.C.}) \text{ (pounds/acre)}$$

where, % M.C. = percent moisture content of corn.

Basically, this formula predicts that farmers stand to lose an additional 48 pounds of corn/acre for each 1% decrease in moisture at harvest. Further calculations using the formula show that estimated loss would be zero for a field harvested at 29% moisture. As another example, a field harvested at 20% moisture would be expected to lose  $1377 - 48(20)$ , or about 417 pounds of corn/acre.



*Digestive tract of a mallard showing importance of waste corn to the diet.*

Farmers should use this formula with some caution because other factors such as hail, wind, and combine operation can influence corn loss. However, if normal harvest operations occur, the formula can estimate the amount of corn left in each field. These estimates thus provide the initial baseline for determining the amount of corn potentially available for ducks.

Average change in waste corn abundance following various farming practices on freshly harvested fields on the Texas High Plains.

<u>Farming practices</u>	<u>Waste remaining after farming practice (lbs/acre)</u>	<u>Initial total waste (lbs/acre)</u>	<u>Loss (%)</u>
Freshly harvested then disked once	56	245	77
Freshly harvested then grazed	65	416	84
Freshly harvested then hand salvaged	297	702	58
Freshly harvested then deep plowed	5	212	98

## **What Happens to Waste Corn Following Initial Harvest?**

Once corn is harvested, the fields undergo a variety of agricultural treatments such as grazing, burning, disking, plowing, or salvaging waste corn by hand. All of these activities have a profound effect on the amounts of waste corn that will remain available for ducks and other wildlife.

For example, disking fields once or twice with a tandem disk removed 77% of the corn from the ground's surface. Deep plowing, which often exceeded depths of 1 foot, removed 98% of the total waste. Grazing removed 84%, whereas hand salvaging removed 58%. Burning does not destroy any significant amount of waste corn, but greatly increases corn availability because burning removes stalk litter.

During our studies, ducks always preferred feeding in burned cornfields, if available, because corn is located so easily by feeding ducks. Generally, ducks like to feed in fields where they can obtain food in the least amount of time. Accordingly, we recommend that farmers burn all or parts of their fields to encourage use by ducks. Burning can discourage pheasants from using playas (see Management Note 3, 1984). Thus, it is wise to leave adequate unburned areas of corn where pheasant management is being emphasized. Because burning removes soil-protecting litter, we recommend that fields should be disked following use by waterfowl as a means of reducing soil erosion.

Disked fields also are used by waterfowl, but as mentioned, disking removes 77% of the corn. Thus, as corn acreage planted in the High Plains begins to decline because groundwater supplies for irrigation are dwindling, we do not

encourage disking as the best method to maximize abundance and availability of corn for ducks.





*Changes in the availability of waste corn on the Texas High Plains following harvest (top), burning (middle), disking once (bottom right), and deep plowing (bottom left). Field-feeding ducks prefer burned and disked fields.*

Landowners also must remember that ducks need food available throughout the entire wintering period on the High Plains (September to March). Extensive plowing in the fall or early winter will greatly reduce the amounts of food available later. Thus, disking and plowing should be delayed until late winter to insure a constant food supply. This makes grazing an acceptable management practice for ducks because grazing delays fall plowing and grazed fields still contain relatively large amounts of waste corn after use by cattle or sheep.



*Over 1 million ducks winter on the High Plains during years when playas contain water.*

We also noted that the management of waste corn for attracting ducks will be most successful if practiced near large playas that usually contain water throughout the winter. Indeed, the availability of water is the key factor controlling duck numbers on the High Plains, so corn management undertaken near water sources should attract more ducks. During our studies, for example, ducks seldom flew more than 3 miles from playa lakes to fields and often traveled less than 1 mile.

The impact of waterfowl feeding on waste corn remaining in fields after harvest.

<u>Farming practice</u>	<u>Waste before feeding (lbs corn/acre)</u>	<u>Waste after feeding (lbs corn/acre)</u>	<u>Percentage removed</u>
Burned fields	256	7	98
Disked fields	77	14	82

### **Do Farmers Benefit From Ducks?**

The answer to this question is a resounding "yes," with a note that the potential to realize benefits from waterfowl can be greater in the future.

Our studies showed the field-feeding ducks removed an average of 85% of the waste corn present in a given field and that removal was as high as 98% in burned fields. Removal of corn can be beneficial because less corn is available to sprout as "volunteer" during the next growing season. Indeed, each year of the study we noted, and landowners confirmed, that fields receiving intensive use by field-feeding ducks had the least problem with "volunteer" corn. Landowners, especially those that burn field litter, may wish to check fields in early morning or evening for the presence of feeding ducks and not plow that field until the ducks have moved elsewhere. The same practice can be used on ensilage fields.

Another benefit, especially during January and February, is that ducks feeding on waste corn may ignore irrigated fields of winter wheat, thereby reducing crop damage. We noted that ducks are attracted more often to wheat fields because of the warm, fresh water rather than to eat wheat. To help alleviate damage to winter wheat we advise: (1) water at night to decrease the possibility of ducks locating watered fields; and (2) delay watering, if possible, until late February because most ducks begin leaving the High Plains at this time, returning to northern breeding areas. Thus, a landowner delaying watering from the first week of February to the third or fourth week may find that 50-80% of the ducks have left the area.

### **Other Management Considerations**

Finally, we must mention that corn forms only a part of a duck's diet throughout the winter. Another study conducted by the Department of Range and Wildlife Management showed that ducks obtain natural foods such as insects and seeds in the playas. These foods are important dietary supplements because corn is nutritionally incomplete, particularly in terms of protein. Thus, playa lakes not only provide water for ducks, but the playas also contain essential food sources.

Only a concerted effort by landowners on the Texas High Plains will insure that adequate food and water resources will be present for wintering ducks and other wildlife; little waterfowl habitat is under public ownership. Currently, the duck population wintering on the High Plains is largely underharvested, and the potential for realizing substantial economic returns through proper management is now just undergoing exploration. We have provided here some basic guidelines toward managing waste corn for these birds along with some information concerning waterfowl ecology during

winter. The Department of Range and Wildlife Management at Texas Tech continues to study ducks on the High Plains as a means of developing and improving strategies for good management and recreational value for years to come.

<sup>1</sup> Contribution No. T-9-504 of the College of Agricultural Sciences, Texas Tech University.