



Corn & Soybean News

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Cooperating Departments: Agricultural Economics, Biosystems and Agricultural Engineering, Entomology, Plant and Soil Sciences, Plant Pathology
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1. Nutrient Removal of Corn Stover & Soybean Hay

Lloyd Murdock and Greg Schwab, Plant and Soil Sciences

The dry weather has made hay supplies short, prompting many farmers to look to corn stover and whole soybeans as forage sources. Grain producers want to know how much nutrient removal is occurring and the cost of the removal.

Corn Stover

A yield of 150 to 175 bu/ac results in about 8,000 lbs/acre of corn stover. The total nutrients in this 8,000 pounds is N = 55, P₂O₅ = 27 and K₂O = 115 pounds per acre. If one calculates that a large round bale of corn stover is about 1,200 lbs then the nutrient removal will be about N = 8, P₂O₅ = 4 and K₂O = 17 lbs/bale. Calculating the cost of nutrients per bale using nutrient prices of N = \$0.40/lb, P₂O₅ = \$0.30/lb and K₂O = \$0.25/lb results in 2 different figures. Most people use only P₂O₅ and K₂O costs because the nitrogen in the stover would likely be lost via denitrification, but P and K would normally be recycled as the residue decomposes resulting in a nutrient removal cost of about \$5.50 per bale. If nitrogen is also calculated into the costs, it becomes about \$8.50 per bale.

Soybean Hay

Soybeans baled for hay removes all parts of the plant and the amount of nutrients removed in the hay depends on the stage of growth and the amount of vegetative growth. In the calculations below, two growth stages have been assumed for nutrient removal purposes. The R3

- Corn stover and soybean hay will remove extra P and K.
- Know these costs when marketing corn stover or soybean hay.

(beginning pod) and the R5 (beginning seed) growth stages because they seem to approximate the growth stage and amount of pod fill in the severe drought areas. The costs of the nutrients removed were calculated using $P_2O_5 = \$0.30/lb$ and $K_2O = \$0.25/lb$.

Table 1. Nutrient removal and value of nutrients removed from soybean. Values presented in this table assume average soybean yields.

Soybean Growth Stage	Nutrients Removed (lb/a)		Value of Nutrients (\$/A)		
	P_2O_5	K_2O	P_2O_5	K_2O	Total
R3 (beginning pod)	15	25	4.50	6.25	11.00
R5 (beginning seed)	25	55	7.50	13.75	21.25

2. Insect Control in Corn Storage

Doug Johnson, Entomology

There continue to be questions concerning insect control in stored corn storage. At this time of year it is too late to employ many of the important strategies. But let's have a quick review.

First and foremost: "store clean dry grain in clean dry bins". This will solve the vast majority of problems. Below find a checklist of good storage techniques.

UK-IPM Checklist for Controlling Insects in Stored Corn

Doug Johnson, Extension Entomologist and Sam McNeill, Extension Agricultural Engineer, University of Kentucky

Before Harvest / Pre-Binning

- Clean all equipment used to handle grain (Examples: combines, carts, trucks, receiving pits/hoppers) thoroughly to remove old grain, trash, and debris that might contaminate the new crop.
- Use pressurized air/water.
- Remove all old grain from inside storage bins. Use a shovel, broom and vacuum. Every kernel counts!
- Check for holes and cracks in bin roofs and walls. Seal them to prevent leaks and entry of insects and rodents. (Look closely around ladders, roof vents and other openings).
- Treat the interior floor and bin walls with an approved insecticide.
- Remove spilled grain around pits/hoppers, and storage bins.
- Mow, spray or remove weeds/grass/vegetation around storage bins.
- Treat the outside base of bins and the surrounding area with an approved insecticide.
- Fumigate the space beneath the perforated bin flooring. **Warning!!!** Fumigation is complicated and dangerous. If possible, hire a commercial fumigator. Restricted use pesticide certification is required for purchasing the fumigants. Specialized training from a commercial applicator is strongly recommended. Specialized equipment, including gas masks, self-contained breathing apparatus, and fumigant gas detection equipment is required for safe, effective and economical applications. Obtain and read the product label and manufacturer's instructions.

- Store clean dry grain in clean dry bins.
- Follow the checklists for each stage of storage.

During Harvest / Binning

- Operate combine(s) to minimize grain damage, trash and fines or clean grain mechanically.
- Store corn at 15, 14 or 13% moisture when holding for 6, 9, or more than 9 months, respectively.
- Consider applying a grain “protectant” to the bulk grain mass after drying and cooling. Do NOT apply before heated air drying or to hot grain!!
- Consider applying a “cap out” treatment to the grain surface (Do not apply if a protectant is used).

Post-Harvest / After Binning

- Use “pitfall” traps to monitor insect activity. Use three traps per bin. Check traps weekly in August and September. In colder months trap for four days each month.
- If insects are detected have them identified and classified as primary or secondary feeders. Be especially interested in the true “weevils”.
- If insects are numerous enough to result in a discount or you are planning to hold the grain into the next warm season consider having the grain fumigated.
- Monitor grain temperature and moisture monthly.
- In September, run fans to cool corn to near 60oF.
- In October, run fans to cool corn to near 50oF.
- In November, run fans to cool corn to near 40oF.
- After cooling to 40oF, seal fans with plastic to prevent air movement in the bin.
- Operate fans any time the need arises to control temperature or moisture.

Insecticides and Fumigants Recommended for Corn

Do not use malathion for any treatments. Most forms of malathion are no longer labeled for use and the product no longer provides adequate insect control. See: [ENT-16 Insecticide Recommendations for Corn](#).

Empty bins - applied to walls and floor: Tempo7 SC Ultra. (DO NOT APPLY TO GRAIN!), Actellic® 5E, or Insecto. Do not use the same product for empty bin and grain “protectant” treatments.

Under Floor Fumigants - Chloro-pic (Can not currently be shipped in small containers, you may find that your local dealer has some on hand or in large e.g 200 lb. bottles), Methyl-Bromide, Phostoxin® / Fumtoxin®. **THESE PRODUCTS ARE EXTREMELY DANGEROUS AND REQUIRE SPECIAL EQUIPMENT AND TRAINING!**

Protectant - applied directly to the bulk grain: Actellic® 5E. Insecto may be used as a “protectant”, but some buyers will not accept grain treated with this material. Be sure of your market. (If grain is handled and stored properly this is not generally economically advisable.)

Cap out treatment applied to the top 4" of grain - (Do not make this application if a protectant has been applied to the bulk grain): Actellic® 5E and Insecto for beetles and moths or products containing *Bacillus thuringiensis*, e.g. Dipel7, Javelin7, Sok-B.t.7 etc. for Indian meal moth.

For more information about crop and livestock pests, visit "[Insect Management Recommendations](#)".

3. Low Soil pH Values this Fall

Lloyd Murdock, Paula Howe, Greg Schwab and Frank Sikora, Plant and Soil Sciences and Regulatory Services

Soil samples taken from abnormally dry soils likely will result in soil test pH values being lower than actual soil pH values. Soluble salts have accumulated near the soil surface under dry conditions causing the pH to be lowered. Typically, a combination of plant uptake and adequate rainfall to percolate through the soil is sufficient to keep the soluble salt content in the field soils low enough that pH's on fall soil samples are not noticeably low. The drought has greatly reduced plant growth (thereby lowering the total amount of salts taken up by the plants), and lack of rainfall to leach high levels of salts deeper into the soil causing pH's to be abnormally lowered.

- Dry soils results in lower reported water pH values.
- Buffer pH values should be accurate.

In 1991, a similar condition existed, causing Ken Wells and Grant Thomas (former UK Agronomy Professors) to check soil samples from two Jessamine County drought-stricken tobacco fields. The samples were split with the pH measured on one-half of the sample as taken and the other half was leached to remove soluble salts before the pH reading. The soil pH rebounded after leaching of soluble salts from the sample. This will also occur in the field when we get normal rainfall.

Table 1. Soil pH results from soil samples taken under dry conditions in 1991.

Field	Soil pH of Sample as Taken	Soil pH after Leaching of Soluble Salts
1	5.96	6.66
2	5.82	6.75

There are two ways to handle this problem.

- 1) The samples with very low pH's compared to previous samples can be resampled in late February or March after we have saturated the profile.
- 2) When soil pH is measured in a salt solution it is usually about 0.5 units lower than pH measured in water, but the buffer pH will not be affected by these high salts. To calculate a lime recommendation, assume that the current water pH is about 0.5 units lower than normal and that the buffer pH has not been affected. Using the table in AGR-1 apply lime if needed this fall using the estimated water pH and the actual buffer pH.

4. Crop Management: Early Bird Series

Chad Lee, Plant and Soil Sciences

While commodity prices are higher, the cost of production is also increasing rapidly, making the final net profit a challenge. Producers need to maximize their pre-pay dollars.

- **Make the most of pre-pay dollars.**

Three meetings across Kentucky will be targeting issues relating to pre-pay decisions on seed, seed treatments, foliar fungicides, hybrids, varieties and fertilizer options. In addition, each of these meetings will include a topic on grain storage options. The locations, dates and contact information follows:

Sedalia, Sedalia Restaurant: Thursday, November 15, 2007: contact Lincoln Martin, (270) 527-3285.

Owensboro, Daviess County Extension Office: Friday, November 16, 2007: contact Clint Hardy, (270) 685-8480.

Shelbyville, Shelby County Extension Office: Tuesday, November 20, 2007: contact Brittany Edelson, (502) 633-4593.

The meetings are scheduled to begin at 9:00 am and will conclude between 2:30 and 3:00 pm. Lunch will be sponsored by the Kentucky Soybean Board and the Kentucky Corn Growers Association.

Pesticide education credits and certified crop advisor continuing education credits will be sought.

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A handwritten signature in cursive script that reads 'Chad D. Lee'.

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