

Nutrient Removal of Corn Stover and Soybean Hay

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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 (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 P₂O₅ = \$0.30/lb and K₂O = \$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 ₂ O ₅	K ₂ O	P ₂ O ₅	K ₂ O	Total
R3 (beginning seed)	15	25	4.50	6.25	11.00
R5 (beginning pod)	25	55	7.50	13.75	21.25