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Value of Corncobs, Sawdust, and Shavings in Soil Improvement

George Enfield

Helmut Kohnke

Purdue University
Agricultural Extension Service
Agronomy Department

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As a Bedding

Corn cobs, sawdust and shavings are a good substitute for straw bedding. These materials, when dry, have the ability to absorb about the same quantity of liquid as chopped straw (about four times their dry weight), which is important in conserving the most valuable part (liquid) of animal manure. A ton of such material, used to absorb the urine from dairy cattle, will hold approximately 75 pounds of nitrogen and an euqal amount of potash. At the market price of these plant nutrients, they would be worth about $15.00. A ton of manure produced with sawdust, corncobs, or shavings does not make as large an increase the first year as manure produced with straw but the residual effect is usually larger. The ratio of available nitrogen to carbon in these materials is so much lower than in straw that a larger portion of the nitrogen present in the manure is used by the microorganisms to decompose the sawdust, shavings, or corncobs. Later these microorganisms die and decompose and the nitrogen in their bodies again returns to an available form suitable for other plant growth. Therefore, the residual beneficial effect is usually larger.

As a Mulch

Corncobs, sawdust and shavings make an excellent mulch if about 40 pounds of nitrogen (125 pounds of ammonium nitrate, 250 pounds of nitrate of soda, or 200 pounds of sulfate of ammonia or cyanamid) per ton of corncobs, etc. is used to balance available carbohydrates with the available nitrogen. The supplemental nitrogen may not be necessary if the materials are well rotted. The greatest values of a mulch are to decrease soil compaction and silting-over by rain and to increase the water holding capacity. This reduces erosion and improves the physical condition of the soil. Very heavy mulches are effective in controlling weeds. For weed control, mulches should be at least three inches thick. However, mulches of this type are not recommended for field use.

As a Fertilizer When Used Alone

The fertility value of fresh corncobs, sawdust, and shavings is extremely low. On a ton for ton basis, sawdust and shavings contain less than one-third, and corncobs about one-half as much plant food as wheat straw. The nitrogen in these materials is much less available to plants than the nitrogen in fertilizer material. Small amounts of phosphate and potash, approximately two and seven pounds per ton respectively (worth about 45¢ per ton) make these materials truly waste products.

The long time effect on soil fertility for using these materials is usually beneficial. The time needed before this effect is realized is shortened if the materials are first allowed to partially decompose in the pile before they are spread on the land. So called "rotten" sawdust, shavings and corncobs show little or no depressing effect on crop growth because the easily available carbon has been eliminated through the process of decomposition. These materials will decompose most rapidly if they

are supplemented with nitrogen and incorporated in the surface inch or two of soil. Plowing these materials under delays decomposition and will cause a more noticeable unfavorable effect.

None of these materials make the soil appreciably acid if they are applied at a rate of not more than five tons per acre. The depressing effect in crop growth that is so often noticed after making the heavy application of these materials is due to the reduction of available nitrogen rather than increase in soil acidity. Limestone has little or no effect on this reduction. Tests have shown that the depressing effect can be eliminated by applying about 40 pounds of nitrogen with each ton of these waste products. Inoculated legumes grow about as well on soils receiving these materials as the same soil not treated. It is the non-legume crops or un-inoculated legumes that are affected by the reduction in available nitrates.

Fertility Value of Corncobs and Cob Ash

Analysis of material from Soils and Crops Farm, Lafayette. Crop rotation - Corn, Soybeans, Wheat, Alfalfa. Soil treatment - Corn stalks and straw returned - 600 pounds 3-12-12 fertilizer per rotation.

CORNCOBS

	Percent	Lbs/Acre in 100 bus. corn	Lbs/Ton	Value/Acre	Value/Ton
Nitrogen	.43	6.2	8.6	.62	.86
Phosphate (P_2O_5)	.08	1.2	1.6	.06	.08
Potash (K_2O)	.34	4.9	6.8	.27	.37
Magnesium Oxide (MgO)	.05	.7	1.0	---	---
Calcium Oxide (CaO)	.018	.26	.36	---	---
		TOTAL	$.95	$.95	$1.31

DRY UNLEACHED COB ASHES

	Percent	Lbs/Ton	Value/Ton
Lime (Acid Neutralizing Value)	33	660	$ .80
Phosphate (P_2O_5)	4.4	88	7.04
Potash (K_2O)	26.5	430	21.50
	TOTAL		$29.34

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