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FARM ANIMAL MANURES - Franz R. Kegel

Every once in a while we farm advisors are asked about manure as a fertilizer. The questions cover a wide range that often cannot be answered in a few words. Most of the questions can be answered from information in two available publications. The *Western Fertilizer Handbook* should be in the office of every fertilizer dealer. A manual titled *Farm Animal Manures* (#4021) is available for $2.50 at the Extension Office. Tables in this report are taken from these publications.

While we often refer to animal manure as if they were all alike, this is definitely not the case, just as commercial fertilizer comes in many different forms. There is a distinct difference in manures based on the species they come from as well as how the material was collected and stored. Differences can be found in the nutrient content and in the rate that these nutrients become available. If a grower is contemplating the use of animal manures it would probably be wise to have the material analyzed for major nutrients.

The availability of the major nutrients is another question. Particularly nitrogen will become available to plants at different rates depending on the source of the manure. The N in fresh chicken manure will be available at about 90% the first year while dry corral manure will be available at only 20-40% The material decay series listed below shows this and can be used as a guide. As with commercial fertilizers the availability of nutrients must be considered from an economic as well as from an environmental point of view. Animal manures applied at too high a rate have caused serious nitrate leaching problems in the U.S. and elsewhere. Manure can be the source of nitrate contamination of water sources. On the other hand, slow release manures may be used to reduce leaching in sandy soils.

It has been reported that phosphate and potassium is as available to plants as are these nutrients in commercial fertilizers. The minor nutrients are also included in manures and they can help overcome deficiencies. Some of these benefits may be connected with the addition of carbon containing organic matter that improves soil structure and may hold nutrients in forms available to plants.

Manure is a low percentage fertilizer that requires large amounts applied to fill the nutrient needs of crops. So the cost of nutrients applied to a field must include the cost of transportation. The non-nutrient component must be transported and paid for which limits the distance it can profitably be hauled. Care must also be taken that these bulky materials are spread evenly in the field. Many times broadcast fertilizers are spread unevenly followed by uneven crop growth.

The disadvantage of manure that is frequently discussed is that of weed seed contamination. The weed seed may come from seeds in livestock feed that is not destroyed in the digestive tract. Many weed infestations have been established this way. Weeds may also have been scraped up when cleaning livestock corrals. With this in mind some growers, particularly members of Calif. Organic Farmers, have been encouraging composting. In a composting process the organic matter becomes hot in the composting process which destroys the weed seeds. There are also health and nuisance factors such as smell that have to be considered. Flies from manure piles and the smell from freshly spread chicken manure can cause problems with neighbors. In any case it is prudent to incorporate manures as soon as possible after spreading. On the farm on which I first worked the plow always was pushing the manure spreader in order to preserve the maximum of nutrients.

For those who will be using farm animal manures I would advise a copy of the manual *Farm Animal Manures* and the *Western Fertilizer Handbook*.

Total N Input Required to Maintain a Yearly Mineralization Rate of 200 Pounds per Acre per Year Through a 20-Year Period for Two Decay Series for Each of Six Types of Waste.* From Pratt, 1973.

Material and Decay Series	Time, Years							
	1	2	3	4	5	10	15	20
	(nitrogen input, lbs./acre/year)							
Chicken manure, 1.6% N								
0.90, 0.10, 0.075, 0.05, 0.04, 0.03	222	220	218	217	216	214	212	210
0.90, 0.10, 0.05	222	220	219	218	217	213	209	207
Fresh bovine waste, 3.5% N								
0.75, 0.15, 0.10, 0.075, 0.05, 0.04, 0.03	267	253	246	242	240	231	223	218
0.75, 0.15, 0.10, 0.05	267	253	246	244	241	230	221	215
Dry corral manure, 2.5% N								
0.40, 0.25, 0.06, 0.03	500	312	349	332	326	295	272	255
0.40, 0.25, 0.06	500	312	349	316	308	258	232	218
Dry corral manure, 1.5% N								
0.35, 0.15, 0.10, 0.075, 0.05, 0.04	571	412	367	343	336	291	270	240
0.35, 0.15, 0.10, 0.05	571	412	367	364	344	281	245	225
Dry corral manure, 1.0% N								
0.20, 0.10, 0.075, 0.05, 0.04, 0.03	1000	600	490	475	451	361	300	261
0.20, 0.10, 0.05	1000	600	580	489	437	277	225	208
Liquid sludge, 2.5% N								
0.35, 0.10, 0.06, 0.05, 0.04, 0.03	571	465	427	400	384	331	292	265
0.35, 0.10, 0.05	571	465	437	406	379	290	245	223

*The first decay series presented is meant to represent a slower rate of mineralization of the residual N from each yearly application.

Average Analysis of Organic Materials

	Nitrogen % N	Phosphoric Acid % P_2O_5	Potassium Oxide % K_2O	Organic Matter % O.M.	Cubic Feet per Ton
Bulky Organic Materials					
Goat manure	2.77	1.78	2.88	60	70
Dairy manure	.7	.30	.65	30	55
Steer manure	2.0	.54	1.92	60	70
Horse manure	.7	.34	.52	60	75
Hog manure	1.0	.75	.85	30	60
Sheep manure	2.0	1.00	2.50	60	70
Rabbit manure	2.0	1.33	1.20	50	70
Poultry droppings	4.0	3.2	1.9	74	55
Poultry manure	1.6	1.25	.9	50	50