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FERTILIZATION AND LIMING TO ESTABLISH AND MAINTAIN VEGETATIVE COVER FOR SOIL CONSERVATION

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Vegetative cover is essential for the prevention of soil loss by wind and water erosion. However, the amount of vegetation required for soil conservation is generally less than for an economically profitable level of production. For this reason fertilization and lime requirements also are less when soil conservation is the primary goal.

Fertilization

Plant nutrients are applied to correct soil deficiencies, and their need and application rate should be based on the level of each nutrient in the soil, the plant species and desired amount of growth within climatic limitations.

Rates of N, P_2O_5 and K_2O for various levels of production are provided in other publications. It is the purpose of this publication to identify a portion of fertilization that can be associated with the establishment or maintenance of sufficient vegetative cover to hold the soil against erosion. The time of application should be consistent with acceptable cultural and management practices for the species. Rates of N, P_2O_5 and K_2O for perennial grasses are shown in Table 1 and for legumes in Table 2. For a legume-grass mixture, the legume rate should be used.

To use the tables, first obtain soil nutrient levels from a reliable soil test or from other available data such as soil type, past fertilization and cropping records or soil test summary data. Then read across to the appropriate rate of N, P_2O_5 and K_2O in pounds per acre.

Liming

Liming acid soils raises the pH, neutralizes the effects of toxic aluminum and manganese, adds calcium and magnesium and improves conditions favorable for microbial activity, including nitrogen fixing by bacteria.

The desired pH range to maintain in a soil is largely dependent on the cropping system. For example, a grass grows satisfactorily at a lower pH than legumes. The term "lime requirement" includes the amount of limestone needed to maintain a satisfactory pH for 3 to 5 years in addition to the amount needed to bring the pH into the desired range.

The application of nitrogen in the ammonium form contributes to the development of soil acidity. Therefore, the "lime requirement" is dependent on fertilization. When nitrogen fertilization of grasses is minimal, liming rates also will be low. A guide for minimum liming rates for grasses is presented in Table 3.

Limestone application to establish a soil pH favorable for the development of nitrogen fixing bacteria is an important factor in establishing and maintaining a satisfactory legume stand. Therefore, the "lime requirement" for legumes changes little whether the crop is used to meet a conservation or a production goal. Suggested rates for legumes are found in Table 4.

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Table 1. Minimum rates of N, P_2O_5 and K_2O for bermuda grasses, bahia, Klein and other summer perennial grasses.

	Pounds per acre		
Soil level*	N**	P_2O_5	K_2O
VL, L	40	40	40
M	0	20	20
H, VH	0	0	0

* VL = very low; L = low; M = medium; H = high; VH = very high.
** Very few soils are medium or above in available N.

Table 2. Minimum rates of N, P_2O_5 and K_2O for establishing and maintaining specific legumes.

	Pounds per acre		
Soil level	N	P_2O_5	K_2O
	Alfalfa, Louisiana S_1 white clover		
VL, L	0	80	80
M	0	40	40
H, VH	0	0	0
	Crimson, Yuchi and similar winter clovers		
VL, L	0	60	60
M	0	30	30
H, VH	0	0	0
	Vetch, peas, sweet clovers and other legumes		
VL, L	0	40	40
M	0	20	20
H, VH	0	0	0

Table 3. Minimum rates of ground agricultural limestone for grasses.

Soil pH range	Tons per acre
5.6 and above	None
5.3 to 5.5	1
5.2 and below	2

Table 4. Minimum rates of ground agricultural limestone for legumes.

	Tons per acre		
Soil pH range	Sands	Sandy loams and loams	Clays and clay loams
6.4 and above	None	None	None
6.0 to 6.3	1	1½	2
5.6 to 5.9	1½	2	2½
5.5 and below	2½	3	3½

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