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Soil Fertility Management

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DESCRIPTIONS OF THE SOIL TEST INTERPRETIVE CATEGORIES USED BY THE UNIVERSITY OF MARYLAND SOIL TESTING LABORATORY

The University of Maryland Cooperative Extension Service Soil Testing Laboratory generates numerical values, or soil test results, that historically have been grouped into five broad categories that describe the relative crop availability of a given nutrient: “Very Low,” “Low,” “Medium,” “High,” and “Very High.” These five categories have been reorganized into four categories and renamed as follows: “Low,” “Medium,” “Optimum,” and “Excessive.”

Descriptions of the soil test interpretive categories are presented below. These categories describe the relative crop availability of a given nutrient and the expected response from application of that nutrient.

Low: The nutrient concentration in the soil is inadequate for optimum growth of most crops and will very likely limit plant growth and yield. There is a high probability of a favorable economic response to additions of nutrients.

Medium: The nutrient concentration in the soil may or may not be adequate for optimum growth of most crops and plant growth and yield may or may not be limited. There is a low to moderate probability of a favorable economic response to additions of the nutrient.

Optimum: The nutrient concentration in the soil is adequate for optimum growth of most crops. There is a very low probability of a favorable economic response to additions of the nutrient.

Excessive: The nutrient concentration in the soil is more than adequate for optimum growth of most crops. Nutrient additions will be unprofitable and may have undesirable effects on growth of some crops. Erosion and runoff from soils that are excessive in phosphorus may have negative impacts on surface water quality.

Historically, numerical soil test values have been presented in units of “pounds per acre” of soil test nutrient. An alternative method for expressing the relative level of plant available nutrient measured by soil testing uses “soil fertility index values.” Soil fertility index values comprise a continuous relative scale where the highest soil nutrient concentration within the “optimum” range is set equal to a fertility index value of 100.

The numerical values that define the five old soil test categories and the four new soil test categories are presented in Table 1, on page 2. Conversion from the old “pounds per acre” scale to the new soil fertility index values is easily accomplished by following the conversion sequences described in Table 2, also on page 2.

Table 1. Numerical values for Mehlich 1 soil test nutrients, expressed as the traditional lbs/A and as fertility index values that define the old "Very Low," "Low," "Medium," "High," and "Very High" soil test categories and the new "Low," "Medium," "Optimum," and "Excessive" soil test categories.

Soil Test Categories					
"old" >	**Very Low**	**Low**	**Medium**	**High**	**Very High**
"new" >	**-----**	**Low**	**Medium**	**Optimum**	**Excessive**
Phosphorus					
lbs/A P2O5	0 – 29	30 – 61	62 – 102	103 – 205	> 205
Index Value	-----	0 – 25	26 – 50	51 – 100	> 100
Potassium					
lbs/A K2O	0 – 35	36 – 84	85 – 160	161 – 320	> 320
Index Value	-----	0 – 25	26 – 50	51 – 100	> 100
Magnesium					
lbs/A Mg	0 – 35	36 – 70	71 – 124	125 – 265	> 265
Index Value	-----	0 – 25	26 – 50	51 – 100	> 100
Calcium					
lbs/A Ca	-----	0 – 429	430 – 860	861 – 1720	> 1720
Index Value	-----	0 – 25	26 – 50	51 – 100	> 100

Table 2. Conversion sequences for converting between "pounds per acre" of soil test nutrient and soil fertility index values.

To convert from "pounds per acre" of soil test nutrient to soil fertility index value, multiply "pounds per acre" by the value in Column 1 and then add the value in Column 2.	Column 1	Column 2	To convert from soil fertility index value to "pounds per acre" of soil test nutrient, subtract the value in Column 2 from the soil fertility index value and then divide by the value in Column 1.
P_2O_5, lbs/A, pounds per acre	0.499	(-2.327)	P fertility index value
K_2O, lbs/A, pounds per acre	0.314	(-0.439)	K fertility index value
Mg, lbs/A, pounds per acre	0.382	0.271	Mg fertility index value
Ca, lbs/A, pounds per acre	0.058	0.403	Ca fertility index value

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