



FERTILIZER RECOMMENDATION TABLE

The recommendations in the table below are to be used only if you are growing a crop different from that given on your report form. These recommendations cannot be as specific as those on your report. Detailed recommendations for all agronomic crops can also be found on our website, www.aasl.psu.edu

To use the table, follow these steps:

1. Select the *Soil test level* column that best represents the soil nutrient levels from your report.
2. Next, select the *Crop* you intend to grow from the first column.
3. Follow the *Crop* row across the sheet until you come to the proper *Soil test level* column selected in step 1. Your fertilizer recommendation is in this block, expressed as N-P₂O₅-K₂O lbs/A.

The total amount of required plant nutrients is given. Application instructions, such as those for using a starter fertilizer, or fall versus

spring application are also noted. Adjustments for expected yields are given below.

Adjustments to recommendations

EXPECTED YIELD—Adjust the recommendation in the table for different expected yield by increasing or decreasing the recommendation in the table proportionally. For example, to determine a corn grain recommendation for an expected yield of 210 bu/A, multiply the 150 bu/A recommendation in the table by 1.4 (210÷150=1.4). For the low P and low K category, the new recommendation is 210-140-170.

MANURE—It is important to consider nutrient credits from manure applied previously or to the current crop and adjust fertilizer rates accordingly. To determine how to account for nutrient inputs from manure, see the *Manure Nutrient Management* section of the Penn State Agronomy Guide (<http://extension.psu.edu/agronomy-guide>).

PREVIOUS LEGUME—Reduce application of N according to guidelines provided in Table 1.2.8 of the Penn State Agronomy Guide.

Crop (expected yield)	Soil test level*								
	Low P, Low K	Low P, Opt K	Low P, Hi K	Opt P, Low K	Opt P, Opt K	Opt P, Hi K	Hi P, Low K	Hi P, Opt K	Hi P, Hi K
Corn Grain (150 bu/A)	150-100-120	150-100-50	150-100-0	150-60-120	150-60-50	150-60-0	150-0-120	150-0-50	150-0-0
Corn Silage (22 T/A) or Forage Sorghum (19 T/A)	160-120-250	160-120-180	160-120-0	160-90-250	160-90-180	160-90-0	160-0-250	160-0-180	160-0-0

Notes for corn grain, corn silage, forage sorghum: Use 100 to 300 lb/A of a starter fertilizer. On soils with excessive nutrient levels or for late planting on soils with optimum or higher nutrient levels, a starter fertilizer may not be necessary. For corn following a legume, reduce the N recommendation according to Table 1.2-8. For more efficient utilization, apply 50 to 90 percent of the nitrogen when the corn is 10 to 20 inches tall. When double cropping corn with rye, you can apply an additional 50 to 90 lb/A of nitrogen to the rye. For sorghum-sudangrass, apply all of the fertilizer before seeding. The N recommendation for forage sorghum would be 130 lb N/A.

Alfalfa (5 T/A)	0-130-280	0-130-250	0-130-0	0-80-280	0-80-250	0-80-0	0-0-280	0-0-250	0-0-0
Clover, Trefoil, Crown-Vetch (4 T/A)	0-120-190	0-120-160	0-120-0	0-60-190	0-60-160	0-60-0	0-0-190	0-0-160	0-0-0

Notes: Alfalfa, clover, trefoil, crown-vetch: For establishment, especially under adverse conditions, banding 100 to 300 lb/A of a starter fertilizer may be beneficial. For no-till, use no starter nitrogen

Cool-Season Grasses: Orchardgrass, Brome, Timothy, Reed Canary (4 T/A)	200-110-230	200-110-200	200-110-0	200-60-230	200-60-200	200-60-0	200-0-230	200-0-200	200-0-0
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Notes: Grasses: For establishment, especially under adverse conditions, banding 100 to 300 lb/A of a starter fertilizer at planting may be beneficial. Apply 30 lb of nitrogen in late summer of the establishment year. For established stands, split the nitrogen into three applications before each cutting: spring, early summer (with P2O5 and K2O), and early fall. Base the amount applied at each application time on the expected yield for the next cutting.

Soybean (50 bu/A)	0-90-130	0-90-70	0-90-0	0-50-130	0-50-70	0-50-0	0-0-130	0-0-70	0-0-0
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Notes: Soybeans—Do not use a starter fertilizer with soybeans. When double cropping, add the P and K to the barley.

Wheat** (60 bu/A) or Rye (40 bu/A)	60-90-120	60-90-110	60-90-0	60-60-120	60-60-110	60-60-0	60-0-120	60-0-110	60-0-0
Barley** (80 bu/A)	60-90-150	60-90-120	60-90-0	60-50-150	60-60-120	60-50-0	60-0-150	60-0-120	60-0-0

Notes: Wheat, rye, barley—At planting time, 100 to 300 lb/A of a starter fertilizer may be applied, especially on low-testing soils or under adverse growing conditions. Do not apply more than 15 lb of nitrogen or 30 lb of nitrogen + potash through the drill. If plants didn't tiller well in fall, apply the N by mid-March; otherwise, apply the N any time up to growth stage 5.

Oats** , Grain Sorghum (80 bu/A)	60-90-140	60-90-120	60-90-0	60-70-140	60-70-120	60-70-0	60-0-140	60-0-120	60-0-0
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Notes: Oats or grain sorghum—Apply 100 to 300 lb/A of a starter fertilizer. Do not apply more than 20 lb of nitrogen or 45 lb of nitrogen + potash through the drill. Apply the N with the other fertilizer before planting.

*Mehlich 3 soil test levels used to calculate recommendations in this table are as follows:

Test level	P (ppm)	K(ppm)
Low	15	50
Optimum	30	100
High	60	200

**Because of serious potential for lodging, it is very important to take the full credit for manure and residual N from previous manure applications for small grain crops.

For more information consult the current Penn State Agronomy Guide (<http://extension.psu.edu/agronomy-guide>) or contact your local Penn State Cooperative Extension office.



LIMING MATERIAL CONVERSIONS TABLE FOR FIELD CROPS

The limestone recommendation on your soil test report is based on the use of a liming material equivalent in neutralizing power to 100% calcium carbonate limestone. The recommendations are in pounds of calcium carbonate equivalent (CCE) per acre. Use of a liming material that is not equivalent in neutralizing power to pure calcium carbonate limestone (100% CCE) must be adjusted so that you actually apply enough liming material to neutralize the acidity in your soil. All agricultural liming materials sold in Pennsylvania are required by law to be labeled with their CCE. Using the CCE of your liming material, the amount required to supply the recommended amount of neutralizing power (CCE) for your soil may be calculated as shown below or read directly from the table.

It is also very important that a liming material be ground fine enough to be effective. Pennsylvania aglime regulations classify agricultural liming materials into the following three groups based on fineness:

- 1. Fine-sized:
 - 95% passing 20-mesh screen
 - 60% passing 60-mesh screen
 - 50% passing 100-mesh screen
- 2. Medium-sized:
 - 90% passing 20-mesh screen
 - 50% passing 60-mesh screen
 - 30% passing 100-mesh screen
- 3. Course-sized: all liming materials that fail to meet one of the above minimums for fineness.

A material meeting the standard for a fine-sized liming material is considered adequate for meeting soil test recommendations in most situations. It is assumed that fine-sized liming materials will react rapidly enough to effect a change in soil pH in the year of application and will typically remain effective for about three years.

Directions for using the conversion table:

Find your soil test limestone recommendation in the left hand column and then read across the table on that line until you come to the column headed by the % CCE nearest to that of your liming material. The number at that point is the pounds of liming material required to meet the limestone recommendation on your soil test.

Because there generally is little advantage to applying more than 8,000 pounds of CCE per acre in any one application to agricultural land, this table is divided into three sections suggesting how the total liming material required can be split over time for more efficient use. Separate the applications by 6 months or at least by tillage operations. (See the right hand column).

Pounds per acre of calcium carbonate equivalent recommendation on your soil test	Percent Calcium Carbonate Equivalent (CCE) of Your Liming Material								Divide total into the following number of applications
	70	75	80	85	90	95	100	105	
1000	1400	1300	1200	1200	1100	1100	1000	1000	
2000	2900	2700	2500	2400	2200	2100	2000	1900	
3000	4300	4000	3700	3500	3300	3200	3000	2900	
4000	5700	5300	5000	4700	4400	4200	4000	3800	1
5000	7100	6700	6200	5900	5600	5300	5000	4800	
6000	8600	8000	7500	7100	6700	6300	6000	5700	
7000	10000	9300	8700	8200	7800	7400	7000	6700	
8000	11400	10700	10000	9400	8900	8400	8000	7600	
9000	12900	12000	11200	10600	10000	9500	9000	8600	
10000	14300	13300	12500	11800	11100	10500	10000	9500	
11000	15700	14700	13700	12900	12200	11600	11000	10500	
12000	17100	16000	15000	14100	13300	12600	12000	11400	2
13000	18600	17300	16200	15300	14400	13200	13000	12400	
14000	20000	18700	17500	16500	15600	14700	14000	13300	
15000	21400	20000	18700	17600	16700	15800	15000	14300	
16000	22900	21300	20000	18800	17800	16800	16000	15200	
17000	24300	22700	21200	20000	18900	17900	17000	16200	
18000	25700	24000	22500	21200	20000	18900	18000	17100	3
19000	27100	25300	23700	22400	21100	20000	19000	18100	
20000	28600	26700	25000	23500	22200	21100	20000	19000	

To convert to 1000 sq. ft. rate, divide the recommended value in the table by 43.5.

For more information consult the current Penn State Agronomy Guide (<http://extension.psu.edu/agronomy-guide>) or contact your local Penn State Cooperative Extension office.

The medium- and coarse-sized materials will be slower to react and thus less effective in changing soil pH in the year of application and will take longer to completely react. The actual fineness must be printed on the liming material label.

Calculation of Actual Lime Requirement:

$$\text{Actual Liming Material Required} = \frac{\text{Soil test limestone recommendation}}{\text{CCE of liming material to be used}} \times 100$$

Example:

Soil Test Recommendation

Limestone—Apply 4,000 lbs. of calcium carbonate equivalent per acre.

Liming Material Label:

Calcium Carbonate Equivalent (CCE) = 80%

$$\text{Actual Liming Material Required} = \frac{4000}{80} \times 100 = 5000 \text{ lbs liming material per acre}$$

The calculations and table for adjusting your recommendations for the CCE of your liming material assume that the material meets the minimum fineness standards for fine-sized limestone. In selecting a liming material, there is generally little advantage in using material much finer than the minimum standards for fine-sized material. In emergency situations where a very rapid change in soil pH is required, paying extra for a finer material may be warranted. However, planning ahead by using a less expensive material and allowing it time to react will generally give better and more economical results.