

**Table 1. Target pH values used by the University of Delaware Soil Testing Laboratory in calculating lime requirements for home, landscape and golf course plantings.**

Plant	Target pH	Plant	Target pH
<b>Fruit Crops</b>		<b>Golf Courses</b>	
Apples	6.0	Bentgrass Fairways	6.5
Blackberries	6.0	Bentgrass Greens and Tees	6.5
Blueberries	5.2	Bluegrass Fairways and Tees	6.5
Cherries	6.0	<b>Lawns</b>	
Grapes	6.0	Athletic Fields	6.5
Nectarines	6.0	Bermuda/Zoysia Mix	6.0
Peaches	6.0	Bluegrass/Ryegrass/Fescue Mix	6.0
Pears	6.0	Industrial Lawns	6.5
Plums	6.0	<b>Groundcovers, Shrubs and Trees</b>	
Raspberries	6.0	Groundcovers ( <i>e.g., pachysandra, periwinkle, ivy</i> )	6.0
Strawberries	6.0	Acid-loving shrubs ( <i>e.g., azaleas, rhododendrons</i> )	5.6
<b>Garden Plants</b>		Evergreen shrubs and trees** ( <i>e.g., holly, pine</i> )	6.0
Mixed Vegetable Garden	6.0	Other shrubs ( <i>e.g., lilac, cotoneaster, forsythia</i> )	6.0
Mixed Flower Bed	6.0	Flowering trees ( <i>e.g., cherry, crabapple, dogwood</i> )	6.0
Roses	6.0	Shade trees ( <i>e.g., ash, maple, oak</i> )	6.0

\* For Douglas Fir, use a target pH of 5.6

**Table 2. Home garden and landscape liming table for target pH 5.2 -- rate in lbs lime/1000 square feet.**

Water pH ↓	Buffer pH																			
	7.95	7.90	7.85	7.80	7.75	7.70	7.65	7.60	7.55	7.50	7.45	7.40	7.35	7.30	7.25	7.20	7.15	7.10	7.05	7.00
5.1	0	0	0	0	0	0	0	0	0	0	0	0	25	25	25	25	25	25	25	25
5.0	0	0	0	0	0	0	25	25	25	25	25	25	25	25	25	25	25	25	50	50
4.9	0	0	0	0	25	25	25	25	25	25	25	25	50	50	50	50	50	50	50	50
4.8	0	0	0	25	25	25	25	25	25	50	50	50	50	50	50	75	75	75	75	75
4.7	0	0	25	25	25	25	25	50	50	50	50	50	50	75	75	75	75	100	100	100
4.6	0	0	25	25	25	25	50	50	50	50	50	50	75	75	75	100	100	100	100	125
4.5	0	25	25	25	25	50	50	50	50	75	75	75	100	100	100	125	125	125	125	125
4.4	0	25	25	25	50	50	50	75	75	100	100	100	100	125	125	125	150	150	150	175

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*To convert the lime rate from lbs/1000 square feet to tons/ac, divide the lime rate by 50. A lime rate of 50 lbs/1000 square feet would be equal to 1.0 ton/ac.*

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*To convert the lime rate from lbs/1000 square feet to lbs/100 square feet, divide the lime rate by 10. A lime rate of 50 lbs/1000 square feet would be equal to 5 lbs/100 square feet.*

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**Table 3. Home garden and landscape liming table for target pH 5.6 -- rate in lbs lime/1000 square feet.**

Water pH ↓	Buffer pH																			
	7.95	7.90	7.85	7.80	7.75	7.70	7.65	7.60	7.55	7.50	7.45	7.40	7.35	7.30	7.25	7.20	7.15	7.10	7.05	7.00
5.5	0	0	0	0	0	0	0	0	0	0	25	25	25	25	25	25	25	25	25	25
5.4	0	0	0	0	0	0	25	25	25	25	25	25	25	25	25	25	25	25	50	50
5.3	0	0	0	0	25	25	25	25	25	25	25	25	50	50	50	50	50	50	50	50
5.2	0	0	0	25	25	25	25	25	25	50	50	50	50	50	50	50	75	75	75	75
5.1	0	0	25	25	25	25	25	25	50	50	50	50	50	75	75	75	75	75	75	100
5.0	0	0	25	25	25	25	25	50	50	50	50	75	75	75	75	75	100	100	100	100
4.9	0	0	25	25	25	25	50	50	50	50	75	75	75	75	100	100	100	100	125	125
4.8	0	25	25	25	25	50	50	50	50	75	75	75	100	100	100	100	125	125	125	125
4.7	0	25	25	25	25	50	50	50	75	75	75	100	100	100	100	125	125	125	150	150
4.6	0	25	25	25	50	50	50	75	75	75	100	100	100	125	125	125	150	150	150	175
4.5	0	25	25	25	50	50	75	75	75	100	100	100	125	125	125	150	150	175	175	175
4.4	0	25	25	50	50	50	75	75	100	100	125	125	125	150	150	175	175	175	200	200

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*To convert the lime rate from lbs/1000 square feet to tons/ac, divide the lime rate by 50. A lime rate of 50 lbs/1000 square feet would be equal to 1.0 ton/ac.*

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*To convert the lime rate from lbs/1000 square feet to lbs/100 square feet, divide the lime rate by 10. A lime rate of 50 lbs/1000 square feet would be equal to 5 lbs/100 square feet.*

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**Table 4. Home garden and landscape liming table for target pH 6.0 -- rate in lbs lime/1000 square feet.**

Water pH ↓	Buffer pH																			
	7.95	7.90	7.85	7.80	7.75	7.70	7.65	7.60	7.55	7.50	7.45	7.40	7.35	7.30	7.25	7.20	7.15	7.10	7.05	7.00
5.9	0	0	0	0	0	0	0	0	0	0	25	25	25	25	25	25	25	25	25	25
5.8	0	0	0	0	0	25	25	25	25	25	25	25	25	25	25	25	25	50	50	50
5.7	0	0	0	25	25	25	25	25	25	25	25	50	50	50	50	50	50	50	50	75
5.6	0	0	0	25	25	25	25	25	25	50	50	50	50	50	50	50	75	75	75	75
5.5	0	0	25	25	25	25	25	50	50	50	50	50	75	75	75	75	75	100	100	100
5.4	0	0	25	25	25	25	50	50	50	50	50	75	75	75	75	100	100	100	100	100
5.3	0	25	25	25	25	50	50	50	50	75	75	75	100	100	100	100	125	125	125	125
5.2	0	25	25	25	25	50	50	50	50	75	75	100	100	100	100	125	125	125	125	150
5.1	0	25	25	25	50	50	50	50	75	75	75	100	100	100	125	125	125	125	150	150
5.0	0	25	25	25	50	50	50	75	75	75	100	100	100	125	125	125	150	150	150	175
4.9	0	25	25	25	50	50	50	75	75	75	100	100	125	125	125	150	150	150	175	175
4.8	0	25	25	25	50	50	75	75	75	100	100	100	125	125	150	150	150	175	175	175
4.7	0	25	25	50	50	50	75	75	100	100	100	125	125	125	150	150	175	175	175	200
4.6	0	25	25	50	50	50	75	75	100	100	100	125	125	125	150	150	175	175	175	200
4.5	0	25	25	50	50	75	75	100	100	100	100	125	125	150	150	175	175	200	200	200

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*To convert the lime rate from lbs/1000 square feet to tons/ac, divide the lime rate by 50. A lime rate of 50 lbs/1000 square feet would be equal to 1.0 ton/ac.*

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*To convert the lime rate from lbs/1000 square feet to lbs/100 square feet, divide the lime rate by 10. A lime rate of 50 lbs/1000 square feet would be equal to 5 lbs/100 square feet.*

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**Table 5. Home garden and landscape liming table for target pH 6.5 -- rate in lbs lime/1000 square feet.**

Water pH ↓	Buffer pH																			
	7.95	7.90	7.85	7.80	7.75	7.70	7.65	7.60	7.55	7.50	7.45	7.40	7.35	7.30	7.25	7.20	7.15	7.10	7.05	7.00
6.4	0	0	0	0	0	0	0	0	25	25	25	25	25	25	25	25	25	25	25	25
6.3	0	0	0	0	25	25	25	25	25	25	25	25	25	50	50	25	25	50	50	50
6.2	0	0	0	25	25	25	25	25	25	50	50	50	50	50	50	50	75	75	75	75
6.1	0	0	25	25	25	25	25	50	50	50	50	50	50	75	75	75	75	75	100	100
6.0	0	0	25	25	25	25	50	50	50	50	50	75	75	75	75	100	100	100	100	125
5.9	0	25	25	25	25	50	50	50	50	75	75	75	100	100	100	100	100	125	125	125
5.8	0	25	25	25	25	50	50	50	75	75	75	100	100	100	100	125	125	125	125	150
5.7	0	25	25	25	50	50	50	50	75	75	75	100	100	100	125	125	125	150	150	150
5.6	0	25	25	25	50	50	50	75	75	75	100	100	100	125	125	125	150	150	150	175
5.5	0	25	25	25	50	50	75	75	75	75	100	100	125	125	125	150	150	150	175	175
5.4	0	25	25	50	50	50	75	75	75	100	100	125	125	125	150	150	150	175	175	200
5.3	0	25	25	50	50	50	75	75	100	100	100	125	125	150	150	150	175	175	200	200
5.2	0	25	25	50	50	50	75	75	100	100	100	125	125	150	150	150	175	175	200	200
5.1	0	25	25	50	50	75	75	75	100	100	100	125	125	150	150	150	175	175	200	225
5.0	0	25	25	50	50	75	75	100	100	100	100	125	125	150	150	175	175	200	225	225
4.9	0	25	25	50	50	75	75	100	100	125	125	150	150	150	175	175	200	200	225	225
4.8	0	25	25	50	50	75	75	100	100	125	125	150	150	175	175	175	200	200	225	250
4.7	0	25	25	50	50	75	75	100	100	125	125	150	150	175	175	175	200	200	225	250
4.6	25	25	50	50	75	75	100	100	125	125	125	150	150	175	175	200	200	225	250	250
4.5	25	25	50	50	75	75	100	100	125	125	125	150	150	175	325	200	200	225	250	250

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*To convert the lime rate from lbs/1000 square feet to tons/ac, divide the lime rate by 50. A lime rate of 50 lbs/1000 square feet would be equal to 1.0 ton/ac.*

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*To convert the lime rate from lbs/1000 square feet to lbs/100 square feet, divide the lime rate by 10. A lime rate of 50 lbs/1000 square feet would be equal to 5 lbs/100 square feet.*

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**Table 6. Home garden and landscape liming table for target pH 6.8 -- rate in lbs lime/1000 square feet.**

Water pH ↓	Buffer pH																			
	7.95	7.90	7.85	7.80	7.75	7.70	7.65	7.60	7.55	7.50	7.45	7.40	7.35	7.30	7.25	7.20	7.15	7.10	7.05	7.00
6.7	0	0	0	0	0	0	0	25	25	25	25	25	25	25	25	25	25	25	25	25
6.6	0	0	0	25	25	25	25	25	25	25	25	50	50	50	50	50	50	50	50	75
6.5	0	0	25	25	25	25	25	25	50	50	50	50	75	75	75	75	75	75	75	75
6.4	0	0	25	25	25	25	50	50	50	50	50	75	75	75	75	75	75	75	75	100
6.3	0	25	25	25	25	50	50	50	50	75	75	75	100	100	100	100	100	125	125	125
6.2	0	25	25	25	25	50	50	50	75	75	75	100	100	100	100	125	125	125	150	150
6.1	0	25	25	25	50	50	50	75	75	75	75	100	100	100	125	125	125	150	150	150
6.0	0	25	25	25	50	50	50	75	75	75	75	100	100	125	125	125	150	150	175	175
5.9	0	25	25	25	50	50	75	75	75	100	100	100	125	125	150	150	150	175	175	175
5.8	0	25	25	50	50	50	75	75	100	100	100	125	125	150	150	150	175	175	175	200
5.7	0	25	25	50	50	50	75	75	100	100	100	125	125	150	150	150	175	175	200	200
5.6	0	25	25	50	50	75	75	75	100	100	100	125	125	150	150	150	175	175	200	225
5.5	0	25	25	50	50	75	75	100	100	100	100	125	125	150	150	175	175	200	200	225
5.4	0	25	25	50	50	75	75	100	100	125	125	150	150	150	175	175	200	200	225	225
5.3	0	25	25	50	50	75	75	100	100	125	125	150	150	175	175	200	200	225	225	250
5.2	0	25	25	50	50	75	75	100	100	125	125	150	150	175	175	200	200	225	225	250
5.1	25	25	50	50	75	75	100	100	125	125	150	150	175	175	200	200	225	225	250	250
5.0	25	25	50	50	75	75	100	100	125	125	150	150	175	175	200	200	225	225	250	250
4.9	25	25	50	50	75	75	100	100	125	125	150	150	175	175	200	200	225	225	250	250
4.8	25	25	50	50	75	75	100	100	125	125	150	150	175	200	200	200	225	250	250	250

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*To convert the lime rate from lbs/1000 square feet to tons/ac, divide the lime rate by 50. A lime rate of 50 lbs/1000 square feet would be equal to 1.0 ton/ac.*

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*To convert the lime rate from lbs/1000 square feet to lbs/100 square feet, divide the lime rate by 10. A lime rate of 50 lbs/1000 square feet would be equal to 5 lbs/100 square feet.*

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**Example 4-1: Determining the Liming Rate**

**Information Given:**

Plant Type: Flower Bed (from Information sheet -- Figure 4-1)  
 Soil OM: 1% (from Soil Test Report Form- to determine if target pH for a high OM soil should be used)  
 Target pH: 6.0 (from Table 4-3)  
 Water pH: 5.4 (from *Soil pH* on Soil Test Report -- Figure 4-2)  
 Buffer pH: 7.65 (from *Buffer pH* on Soil Test Report -- Figure 4-2)

**Lime Requirement: 50 lbs/1000 square feet or 1.0 ton/ac**

Section of Table 4-6:

Water pH ↓	Buffer pH														
	7.95	7.90	7.85	7.80	7.75	7.70	7.65	7.60	7.55	7.50	7.45	7.40	7.35	7.30	7.25
5.9	0	0	0	0	0	0	0	0	0	0	25	25	25	25	25
5.8	0	0	0	0	0	25	25	25	25	25	25	25	25	25	25
5.7	0	0	0	25	25	25	25	25	25	25	25	50	50	50	50
5.6	0	0	0	25	25	25	25	25	25	50	50	50	50	50	50
5.5	0	0	25	25	25	25	25	50	50	50	50	50	75	75	75
5.4	0	0	25	25	25	25	50	50	50	50	50	75	75	75	75
5.3	25	25	25	25	25	50	50	50	50	0	75	75	75	100	100

### Calculating the Credit for Previous Lime Applications

The rate at which applied limestone reacts in the soil to neutralize soil acidity is relatively slow, often requiring as much as two years to be fully effective. As a result, soils tested for lime requirement within two years of a lime application may still show a need for pH adjustment, even though sufficient limestone was applied initially. Applying the full rate of lime recommended by the current soil test could easily result in overliming of Delaware's poorly buffered, low organic-matter soils and lead to problems such as Mn or Zn deficiency. To avoid the risk of overliming soils, the University of Delaware calculates a *lime credit* for soils limed in the previous 18 months. This credit is based on the previous liming rate and time since application and calculated using the equation:

$$LC = PLR \times LAF$$

where:

- LC* = lime credit in tons/ac  
*PLR* = previous lime rate in tons/ac  
*LAF* = lime availability factor based on time since prior application (*see Table 4-9, below*).

The *net lime requirement (NLR)* is determined by subtracting the lime credit from the lime recommendation based on the current soil test.

**Table 7. Lime availability factors as a function of time since application.**

Time Since Application	Lime Availability Factor
----- months -----	
0 - 6	0.75
7 - 12	0.50
13 - 18	0.25
18+	0.00

**Example 4-2: Calculating a Lime Credit**

**Information Given:**

Previous lime application: 100 lbs/1000 square feet  
Current lime recommendation: 50 lbs/1000 square feet  
Time since application: 15 months  
Lime availability factor: 0.25 (from Table 7)

**Lime Credit:** **25 lbs/1000 square feet**

$$\begin{aligned} LC &= PLR \times LAF \\ &= 100 \times 0.25 \\ &= 25 \text{ lbs/1000 square feet} \end{aligned}$$

**Net Lime Requirement:** **25 lbs/1000 square feet**

$$\begin{aligned} NLR &= CLR - LC \\ &= 50 - 25 \\ &= 25 \text{ lbs/1000 square feet} \end{aligned}$$

#### 4.4.4 Selecting a Liming Material

The selection of a liming material is dependent upon several factors including the need to increase soil Ca or soil Mg concentrations, economics, material availability, desired speed of reaction and ease of use. In this section, liming-material selection will be discussed solely in terms of whether to use calcitic (“Hi-Cal”) or dolomitic (“Hi-Mag”) agricultural grade limestone. For a more detailed discussion of liming-material selection and application, see *Liming Materials and Management -- Appendix APP-10* at the end of this handbook.

In most cases, the lime requirement of the soil can be adequately met by either calcitic or dolomitic limestone, and growers can make their choice based on availability and cost. However, in certain situations, it may be desirable to choose one type rather than the other in order to have the added benefit of increasing either soil Ca or soil Mg concentration without having to apply Ca or Mg fertilizers. To determine whether a specific lime type is recommended, compare the soil test Ca and Mg values on the soil test report form (*see Figure 4-2*) with Table 4-10 below.

**Table 7. Recommended lime type as a function of soil test Ca and Mg fertility index values.**

<b>Selection Criteria</b>	<b>Recommended Lime Type</b>
Soil Test Mg less than 50 FIVs	Dolomitic (“Hi-Mag”)
Soil Test Mg greater than 100 FIVs	Calcitic (“Hi-Cal”)
Soil Test Mg between 50 and 100 FIVs <i>and</i> is less than Soil Test Ca	Dolomitic (“Hi-Mag”)
Soil Test Mg between 50 and 100 FIVs <i>and</i> is higher than Soil Test Ca	Calcitic (“Hi-Cal”)