

Non-Scab-resistant White Potatoes

Management Highlights

- Target pH: 5.2
- Apply N at planting to promote good plant growth early in the season.

Yield Goals

Yield of non-scab-resistant white potatoes resistant is influenced by many factors beyond soil test results and fertilizer application. Cultivar selection, planting date, weather condition, soil type and water-holding capacity, weed, insect and disease pressure and crop management practices are just a few. *For that reason, the University of Delaware does not use yield goals in determining nutrient recommendations for vegetable crops at the present time. Instead, recommended rates are designed to produce maximum economic yields of high market quality in a good to average year.*

Growers should use these nutrient recommendations along with field history data, their knowledge of specific crop requirements, their management plans, and conditions from the current growing season to develop an appropriate fertilizer program for the crop.

Soil pH and Liming

The target pH for non-scab-resistant white potatoes on Delaware soils is 5.2. The lime recommendation for a specific field is calculated from the soil pH and buffer pH measurements using the steps outlined in *Calculating the Lime Requirement – Chapter 3, Section 3.4*. Avoid overliming in order to prevent the development of scab in the crop or deficiency of micronutrients such as manganese.

In most cases, the lime requirement can be met by either calcitic or dolomitic limestone. When soil test Mg is less than 38 FIVs, use dolomitic limestone to

prevent Mg deficiency and increase soil Mg concentrations.

Nitrogen Management

The University of Delaware recommends a total nitrogen (N) rate of **125-150 lbs N/ac** per growing season for non-scab resistant white potatoes. The specific rate and time of application is dependent upon soil type as summarized in Table 1. For the greatest benefit, the total rate should be split into 2 applications.

Fertilizer N rates should be reduced when planting into legume cover crops or when manure has been applied. To calculate the adjustment, see *Nitrogen Rate Adjustments – Chapter 3, Section 3.5.1.2*.

Table 1. Nitrogen recommendations for non-scab resistant white potatoes.

Soil Type Application Method and Timing	N Rate (lbs N /ac)
<u>Loamy sands and sandy loams</u>	
Broadcast and disk in	50
Sidedress 4 -5 weeks after planting	100
<u>Loams and silt loams</u>	
Broadcast and disk in	50
Bandplace with the planter	75 - 100

Phosphorus Management

Yield-limiting phosphorus (P) deficiency is rarely a concern on Delaware soils. Long-term applications of fertilizers and manures have resulted in P accumulations on many soils that are capable of supplying crop needs for several years with no further addition of P.

To determine whether P fertilization is necessary for a specific field, conduct a routine soil test. University of Delaware P recommendations for non-scab-resistant, white potatoes are dependent upon soil

s type, the soil test P value and the P requirement of the crop. A summary of those P recommendations is given in Table 3 below.

Table 3. Phosphorus recommendations for non-scab-resistant, white potatoes.

Application Method and Timing	P Index Value			
	0-25	26-50	51-100	101 +
----- lbs P ₂ O ₅ / ac -----				
Loamy sands and sandy loams				
Broadcast and disk in prior to planting	200	150	100	0*
Loams and silt loams				
Broadcast and disk in prior to planting	100	100	0	0*
Band place with planter	100	50	100	0

* For white potatoes, 30 lbs P₂O₅/ac may be applied to soils testing above "Optimum" (e.g., 101+ FIVs) to replace nutrients removed by the crop.

Potassium Management

The need for potassium (K) fertilization of non-scab-resistant white potatoes is best determined by a routine soil test. Potassium recommendations are based on soil type, the soil test K value and the K requirement of the crop. A summary of University of Delaware K rates for non-scab-resistant white potatoes is given in Table 3.

Table 3. Potassium recommendations for non-scab-resistant white potatoes.

Application Method and Timing	K Index Value			
	0-25	26-50	51-100	101 +
----- lbs K ₂ O / ac -----				
Loamy sands and sandy loams				
Broadcast and disk in prior to planting	300	200	100	0*
Loams and silt loams				
Broadcast and disk in prior to planting	200	100	0	0*
Band place with planter	100	100	100	0

* For white potatoes, 30 lbs K₂O/ac may be applied to soils testing above "Optimum" (e.g., 101+ FIVs) to replace nutrients removed by the crop.

Calcium and Magnesium Management

Calcium (Ca) and magnesium (Mg) needs of non-scab-resistant white potatoes are usually met through routine liming. If the soil test Mg value is low (e.g., less than 38 FIVs) and liming is indicated, use dolomitic limestone to raise soil pH and increase soil Mg. If, however, liming is not necessary but Mg fertilization is still indicated, apply soluble Mg as Mg sulfate or Mg chloride to increase soil Mg. Appropriate application rates are given below in Table 4.

Table 4. Application rates for soluble Mg as a function of Mg fertility index value.

Mg Index Value								
0	5	10	15	20	25	30	35	40
----- lbs soluble Mg / ac -----								
80	70	60	50	40	30	20	10	0

Boron Management

Boron (B) deficiency may occasionally occur in non-scab resistant white potatoes grown on Delaware soils. The best way to determine the need for B fertilization is with a soil test. If the soil test for B is "Low", apply 1 lb/ac of actual B in a blended, broadcast fertilizer or as a soil or foliar spray. *Avoid over-application of B to prevent plant injury from B toxicity.*

Other Nutrients

No other nutrients are known to be limiting to non-scab-resistant, white potato production in Delaware.

Additional Information

See Soil Test Notes 1, 4, 5 and 7 (Appendix 7) and **Extension Bulletin 137: Commercial Vegetable Production Recommendations - Delaware - 2003** (Kee et al., 2003) for additional information concerning nutrient management of non-scab-resistant, white potatoes.