

Sulfur (S)

For minimum sulfur requirement for potato production, irrigation water may provide some or all of the needs. The water may be tested for S content. In sandy, low organic soils as used in most potato production in the Northern States, a soil test will help determine S deficiencies. S is most available in soils with pH greater than 6.0; availability gradually decreases as pH decreases below this level. [Table 1](#) gives S fertilizer rates to avoid deficiency based on soil S levels.

There are no market pressures on S application as there are with N, P and K fertilization. However, there may be disease pressures affecting the desired amount of S fertilization (Pavlista, A.D. 1993. Control of Common Scab with Sulfur and Ammonium Sulfate. Spudman 31(8):13,32,34). There is evidence suggesting that higher amounts of sulfur applied in-furrow can substantially decrease tuber infection by common scab and black scurf. Common scab is especially important in the table-stock and chip-stock markets and somewhat important in the other two major markets. Black scurf is especially important in the table-stock and seed-stock markets. The best form of sulfur to apply is ammonium sulfate (AS) placed in the furrow at planting. [Table 2](#) gives the effect of AS and the equivalent S on these two soil-borne diseases.

Nutrients: Deficiency and Excess Symptoms

The minimum sulfur requirement for potato production is usually satisfied by irrigation water. The water may be tested for S content. In sandy, low organic soils as used in most potato production in the Northern States, a soil test will help determine S deficiencies. To avoid S deficiency symptoms, 25 lb S/acre is sufficient even in the absence of S in the soil or water. S may be added in many forms ([Table 3](#)).

Sulfur deficiency is rare. There is a general yellowing of leaves and leaflets exhibit a slight upward roll. This yellowing is first observed with young leaves and is uniform on affected leaves.

There are no negative effects associated with excessive S.

SULFUR TABLES

Table 1. Minimum sulfur fertilization suggestions for potatoes.

S Soil ppm SO ₄ -S	S to Broadcast lbs/acre*
0-5	25
6-8	15
> 8	0

Table 2. Ammonium sulfate on common scab, black scurf and yield when applied in-furrow at planting.

AS rate lb/acre	Common Scab % Tubers	Black Scurf % Tubers	Effect on US#1 Yield
0-210	Decrease	Slight Decrease	Increase
> 210*	No change	No change	No change

Table 3. Sulfur-containing soil amendments with the amount needed to give one (1) pound of sulfur (S).

Amendment	Pounds Needed for One Pound of Sulfur
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Elemental Sulfur, 99% S	1.00
Degradable Sulfur, 90% S	1.10
Sulfuric Acid, 98% H ₂ SO ₄	3.06
Lime-Sulfuric Solution, 24% S	4.17
Gypsum, 18.6% S, CaSO ₄ x 2H ₂ O	5.38
Ammonium Sulfate, 24% S. (NH ₄) ₂ SO ₄	4.12
Magnesium Sulfate, MgSO ₄	3.14
Potassium Sulfate, K ₂ SO ₄	5.44
Epsom Salts, MgSO ₄ x 7H ₂ O	7.86
Ferric Sulfate, Fe ₂ (SO ₄) ₃	4.16

Ferrous Sulfate, FeSO ₄	4.74
Ferrous Sulfate, FeSO ₄ x H ₂ O	5.30
Ferrous Sulfate, FeSO ₄ x 7H ₂ O	8.69
Aluminum Sulfate, Al ₂ (SO ₄) ₃ x 18H ₂ O	6.94
Ammonium Polysulfide, 45% S, (NH ₄) ₂ S _x	2.22
Ammonium Thiosulfate, 26% S, (NH ₄) ₂ S ₂ O ₃ + H ₂ O	3.85
Calcium Polysulfide, 24% S CaS _x + H ₂ O	4.17
Sulfur Dioxide, 50% S SO ₂	2.00