



## **Using Calcium Sulfate in the Production of Potatoes**

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## Using Calcium Sulfate in Potato Production

High yields of potatoes require high amounts of nutrients. Below is estimated crop removal for potatoes.

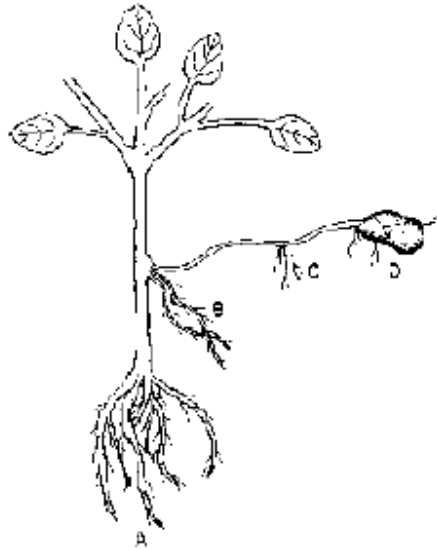
<u>Element</u>	<u>lbs/100 cwt.</u>
Nitrogen	30
Phosphorus	7
Potassium	44
Sulfur	2.5

The longer season potatoes or the ones that grow the longest will require greater amounts of nutrients. Potatoes do not have nearly as extensive a root system as corn or small grains. An average potato hill has a root system of approximately 70 inches in total length. 85-90% of the roots occur in the top 12 inches of a sandy soil, and only slightly deeper in a heavy soil. Potatoes cannot recover nutrients if they leach deeper than two feet. As a result, a nitrogen use efficiency of 50-60% is all that can be expected.

### **Why do we use Calcium Sulfate in Producing Potatoes?**

Calcium Sulfate contains about 22% calcium and 17% sulfur on a dry basis making it an excellent amendment for potatoes.

Although calcium removal by potatoes is not large, there are two factors that make additions of calcium to potatoes critical. First, calcium does not translocate from the leaves to the tubers. The calcium is taken up directly into the tubers. Soil moisture and soil structure is critical for adequate calcium uptake. Secondly, the basal roots or main root system does not contribute to calcium accumulation in the tuber. The roots in the tuber and stolon areas take up calcium and transport it directly to the tuber.



A = Basal Roots; B = Stem/stolon junction roots; C = Stolon Roots; D = Tuber roots

Water taken up by the basal roots goes directly to the foliage and not to the tuber. However, water taken up by the junction roots and/or the stolon and tuber roots go directly to the tuber. Thus calcium which is transported with this water goes directly to the tuber as well.

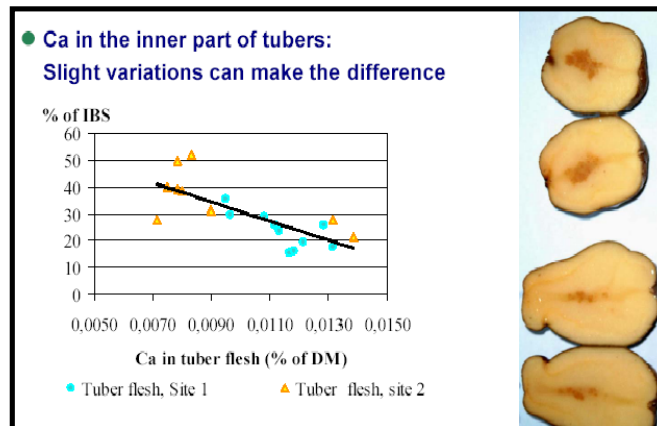
Most calcium absorption occurs from tuber initiation and throughout tuber bulking.

## Why is Calcium needed by the potato?

### Improves Storability/Less Disease

Calcium is a structural component of cell walls. Therefore, the structural integrity of plant cells is dependent upon adequate calcium. Potatoes that are low in calcium are more susceptible to internal brown spot, hollow heart and soft rot disease in the tubers. Calcium therefore improves the storability of the potato.





### Larger number of Grade A Potatoes

Recent research has shown that the calcium content of the soil can signal tuberization by altering the hormonal balance at the stolon tip. As a result the total number of tubers was decreased, but the size of the tubers was increased. Total yield from the grade A tubers was increased by all calcium applications.

### Improves Potato Skin Set

Research has also shown that high levels of available calcium can improve potato skin set. Calcium levels are three to five times higher in the peel than in the whole tuber. A calcium level of .15% in the peel will give better skin finish and a level of .20% gives good disease tolerance.



### Seed Potatoes with greater Calcium Yield Better

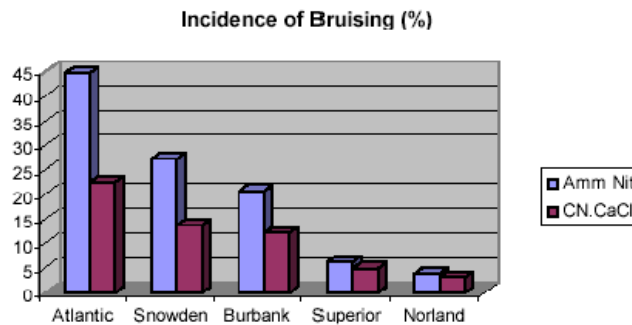
Additional research has shown that seed potatoes grown with available calcium will result in higher yields in the subsequent potato crop grown from these seed pieces.

### Greater Heat Tolerance

Potatoes are a cool season crop. Calcium will also give greater tolerance to heat stress. A study in Wisconsin revealed a 30% reduction in yield when potatoes were heat stressed without adequate calcium.

### Less Bruising

Additional research from Wisconsin shows that by increasing the tuber calcium level the incidence of bruising was reduced.



## Why is Sulfur Needed in Potatoes?

### Large Demand by a Small Root System

Since sulfur is mobile in the soil and the potato feeds primarily in the top foot of soil, it makes sense that sulfur fertilization would be needed for optimum potato production. An added factor is that nearly two thirds of the total sulfur uptake occurs during the bulking period. At least 40 lbs of sulfur is needed per acre for good yields.

### Increases Whiteness

Research has shown that sulfur increases the whiteness in potatoes.

### Decreases Disease/Increased Yield

Other recent research conducted at the University of Nebraska has revealed that applications of sulfur gave as much as a 34% increase in yield. This same research has shown that sulfur applications significantly reduce the incidence of common scab on tubers and black scurf.

## Benefits of Using PRO CAL 40

PRO CAL 40, calcium sulfate dihydrate, is an excellent source of both calcium and sulfur. Due to its fineness, it dissolves quite readily to supply a plant available form of calcium and sulfur. It is roughly 200 times more water soluble than lime and will not raise the pH like lime will, making it a superior source of both calcium and sulfur for potato production. Calcium sulfate use will also improve soil tilth and also has shown to reduce the amount of soil sticking to the potatoes at harvest.



## References

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