



# Factors Effecting Specific Gravity In Potatoes

## FACT SHEET

A number of different nutritional and cultural practices have an impact on specific gravity. Selecting the right varieties also will have an impact on the outcome of specific gravity. Examples of varieties that are prone to low specific gravity are Delaware, Katahdin, Spunta, Pontiac, Norland . Medium specific gravity varieties are- Kennebec, Sebago. High specific gravity – Russet Burbank, Atlantic.

### Seed Quality and Seed Piece Size

Planting good, healthy seed will result in a more vigorous and healthy plant that will result in better yields and higher specific gravity.

Seed pieces greater than 2 inch or between 40—60 grams. A seed piece less than 20 grams will result in plants with reduced vigour and fewer stems and tubers.

Using seed that has been grown under good fertility conditions and stored properly will result in a crop with better specific gravity. Calcium nutrition in seed production is a key component to good seed quality.

### Planting time

Crops planted earlier will result in better specific gravity. The longer a crop has to grow and mature naturally the better the specific gravity of the crop. Specific Gravity is very closely related to proper maturity. Aggressive top killing can also reduce specific gravity.

### Planting Density

Low plant densities caused by incorrect seed spacing, skips or early decay of the seed pieces can result in lower specific gravity. Very high plant densities also lead to low specific gravity due to competition for nutrients and water which can lead to early crop maturity or death.

### Irrigation and Water

A constant moisture content of 65% in the potato hill is ideal for maximum production. Irregular watering with large fluctuations in soil moisture will have a large impact on crop quality and specific gravity. Over or under watering will also impact specific gravity.

A crop that has been grown under average moisture conditions and experiences late season water logged soils will lose specific gravity.

A & L CANADA  
LABORATORIES, INC.

2136 Jetstream Rd.  
London, ON N5V 3P5

Phone: 519-457-2575  
Fax: 519-457-2664  
Aginfo@alcanada.com  
www.alcanada.com

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## Disease, Insects and Weeds

Any condition that competes with nutrients and water in the crop will reduce specific gravity in potato.

Insect or disease damage to the growing crop can reduce the growing period and the plants ability to produce a quality crop.

## Soil Health and overall fertility

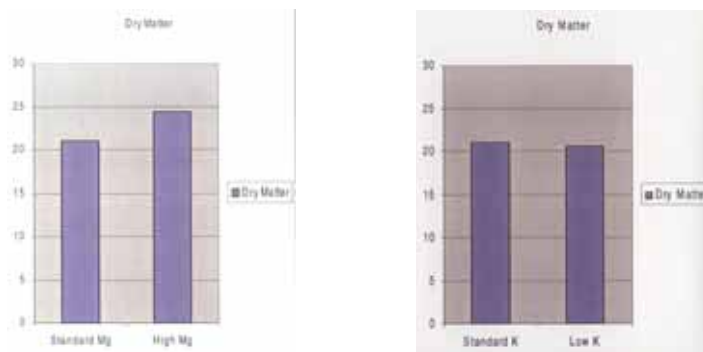
Sandy soils will generally produce a crop with lower specific gravity than heavier soils. However this can be overcome if attention is paid to soil moisture and overall balanced fertility, especially Mg & Ca.

Anything that effects overall yield and quality of the crop will impact on specific gravity.

Soils low in Calcium and high in Aluminum especially have an impact on specific gravity.

Total solids in potato is a function of the amount of pectin's and the density of the finished product. This begins with a well balanced fertility program that pays attention to all nutrients involved in producing a dense tuber. Much of this is related to the potatoes ability to take up nutrients and convert sucrose to carbohydrates in the tuber.

Studies have shown that Mg has a direct impact on the total solids of the tuber. The higher the Mg level in the tuber the greater the total solids. This relationship has a lot to do with the ability of the crop to take up P and convert it to carbohydrates in the tuber.



Mg applied at strategic times in season and adequate soil levels of Mg will increase the crops ability to take up P and increase the overall solids in the crop.

Adequate calcium levels in soils increases root efficiency and the plants ability to take up nutrients and moisture. Excessive Al in soils inhibits Ca and Mg uptake by the crop. Al directly attacks the root cap and interferes with the Ca availability to the crop. Al in excess of 400 ppm in soils not only is toxic to roots but completes with Ca and Mg reducing the availability to the crop.

This cation interference does not include K uptake. Therefore in soils that have high Al availability excessive use of K without reducing Al and increase Mg availability will reduce specific gravity.

Many references discuss the use of K and reduction of specific gravity. K increases yields and size of tubers but does not reduce specific gravity unless Mg nutrition is not addressed. Excessive use of K without Mg will compete with Mg and if this is not addressed the lack of Mg in the crop will reduce specific gravity.

## Specific Gravity and crop rotation

The use of green manures such as alfalfa or clover or rotating with a legume may reduced specific gravity by providing excessive or late season N to the crop.

Care should be taken when using these crops in rotation to monitor the nutritional status of the crop closely and reduce N. In these situations Nitrogen applications should be monitored and fed on an as needed basis to avoid this condition.

Too often we deal with specific gravity by addressing the symptom and not the cause.