

Studies on the distribution of minerals in potato tubers

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Why potatoes?

Potato is the 4th crop in production terms and the 3rd food crop worldwide.

It has an important role in the human diet in the delivery of micronutrients including Fe, Ca, Zn and Mg.

Bioavailability of minerals is high in potatoes:

- High conc of the stimulant ascorbate
- Low concentrations of antinutrients such as phytate and oxalate.

Minerals in tubers are also relevant to agronomy as nutrients are stored for the subsequent season.

Materials and Methods

Five tubers of *Solanum tuberosum* L. cv. Stirling

Five concentric skin samples from bud to stem end.

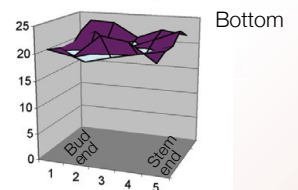
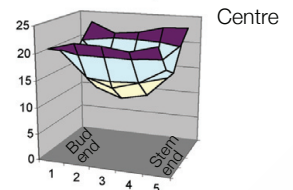
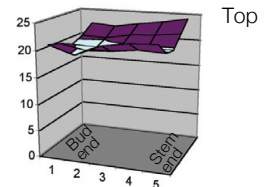
Peeled tubers cut into three slices parallel to soil surface.

Each slice cut into 5 strips longitudinally and each then cut into five pieces.

Freeze-dried samples were then powdered and 0.1g was acid digested and submitted to ICP-MS.



Dry Matter



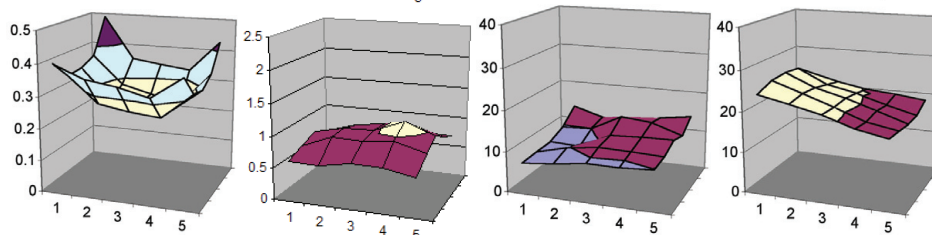
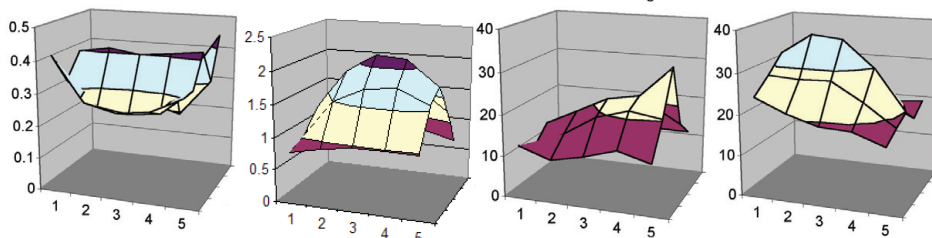
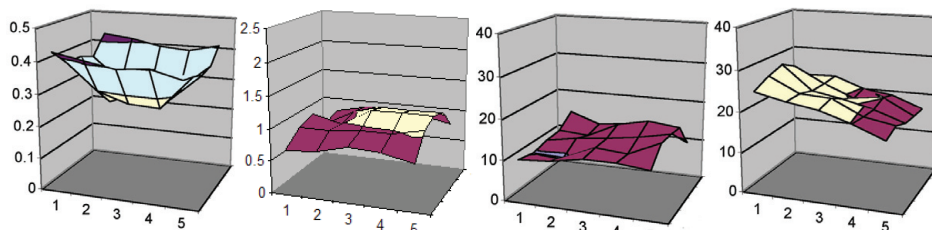
Mineral contents

Calcium (mg/g)

Sulphur (mg/g)

Iron ($\mu\text{g/g}$)

Potassium (mg/g)



Discussion

The central portion of the tuber is low in dry matter (10% DM).

Apart from S, the concentration of minerals is higher in potato skin.

Central part of the tuber is rich in P, S, Zn, Ca & Cu.

Mg, Cl, Fe and Mn increases from bud to stem end, particularly Fe.

K has the opposite trend, decreasing from bud to stem end.

Future

Explore variation in sets of diverse potato germplasm.

Partition environmental and genetic sources of variation.

Use mapping populations to identify QTLs.

Explore effect of candidate genes.

Seek genetic variation for uptake and storage of applied selenium.

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