

Principles of mineral nutrition of the potato crop

Nutrient demand

Due to high production potential and the accumulation of starch in the tubers, potato crops require large amounts of nutrients, especially potassium.

Nutrient removal by potato tubers and foliage, per ton of tuber produced.

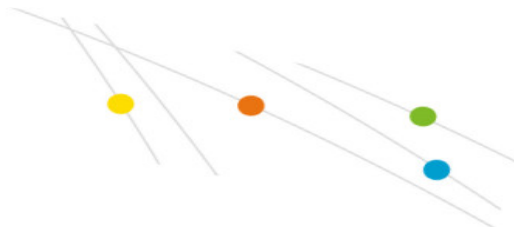
Nutrient	Removal of nutrients by potato tubers and foliage	
N	3,0	- 5,3
P	0,6	- 1,1
K	7,4	- 9,8
Ca	0,10	- 1,5
Mg	0,25	- 0,45
Zn	0,002	- 0,003






Nutriente	Removal of nutrients in kg/mt of fresh tubers	
N	3,0	- 5,3
P ₂ O ₅	1,4	- 2,6
K ₂ O	8,9	- 11,8
CaO	0,14	- 0,21
MgO	0,42	- 0,75

Dean, 1994

Potato crops remove two to three time more potassium than nitrogen.

The specific contributions of the nutrients on potato yield and quality.



CHARACTERISTICS	N	P	K	Ca	Mg	S	Mn	B	Zn
 SIZE OF TUBERS	+	+	+		+		+	+	
 NUMBER OF TUBERS		+	+						
 STARCH			+		+			+	
 SKIN QUALITY				+	+	+	+	+	+
 STORAGE			+	+				+	

Summary of main nutrient functions

Each element has specific functions within the potato development.

Nitrogen: Synthesis of proteins (growth and yield). Nitrate participates in the formation of cytokinins.

Phosphorus: Helps to form and develop the root system and energetic compounds and aids in cellular division.

Potassium: Transports carbohydrates, regulates osmosis, stomata control, photosynthesis enhancement, reduces susceptibility to diseases.

Calcium: Improves tuber storage and skin quality and reduces susceptibility to diseases.

Sulfur: Synthesis of essential amino acids, cysteine and methionine.



Magnesium: Indispensable part of the chlorophyll molecule.

Iron: Synthesis of chlorophyll.

Manganese: Needed for the photosynthesis process.

Boron: Formation of the cellular wall (pectins and lignins). Participates in the metabolism and transport of sugars.

Zinc: Synthesis of auxins.

Copper: Influences the metabolism of nitrogen and carbohydrates.

Molybdenum: Part of the nitrate reductase enzyme and nitrogenase.