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**The application of secondary nutrient as water soluble fertilizers in potato**

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**John Wei**  
Hebei Monband Water Soluble Fertilizer Co.,Ltd  
China



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## Introduction to potato

Potato is the fourth largest harvested crop in terms of volume of production, also the main cash and food crop in mountainous areas world wide.

To get 1 tonne tuber yield, nutritional demand of the whole plant is about: N 5kg, P<sub>2</sub>O<sub>5</sub> 2kg, K<sub>2</sub>O 11.7kg, CaO 3kg, MgO 1kg and S 0.4kg (by NIVAP).

Growers are well aware of the importance of macro-nutrients... but secondary nutrients are also very important for crop yield and quality.

## Role of secondary nutrients in potato crops



## Role of **Ca** in potato crops

- Involved in numerous metabolic processes inside the plant.
- A component of the cell wall  
90% of total Ca inside plant located in cell wall.
- High Ca level in the plant diminishes disease susceptibility.

## Role of **Ca** in potato crops

- Increase the harvest and storage quality
- Reduce inner brown spots and skin bruising



## Role of **Mg** in potato crops

- Indispensable chlorophyll component.
- Increase tuber quality.
- Ensure high harvestable yield.

## Role of **S** in potato crops

- Essential for the synthesis of some amino acids.
- Necessary during all growth stages of the crop.
- Important in reducing the effect of common scab.

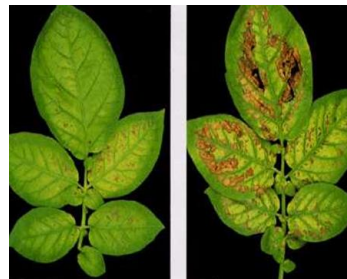
## Ca deficiency symptom

- ◆ Mainly in new leaves.
- ◆ In the new tissues including leaves and the points of apical growth.
- ◆ a bright green band appears along the edge of the young leaves.



## Mg deficiency symptom

- ◆ Start from old leaves.
- ◆ Foliar with interveinal chlorosis.
- ◆ Tissue perish.



## S deficiency symptom

- ◆ Whole plant will be yellowish
- ◆ Slow growth



## Fertilization strategy for secondary nutrients

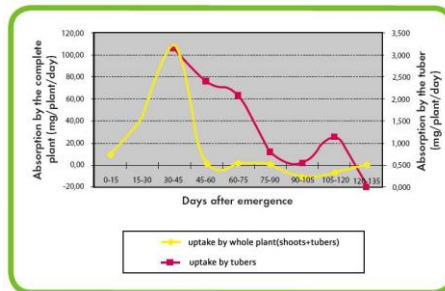
- S can be supplied in different ways:
  - From compound ( most are S base).
    - SOP
    - AS
- Ca should be pay more attention due to its large requirement (more than P) is usually ignored and for its special pattern of uptake by potato crops.

## Feature of Ca uptake by the potato crop



## Secondary nutrient water soluble fertilizer

The absorption rate of Ca by tuber concentrated between 45-75 days after emergence.



Calcium absorption by potato plant  
 Source: Kolbe, 1997, Kolbe and Stephen-Beckmann 1977

## Ca uptake of potato crop

- Not mobile in plant
- Leaves absorbed Ca will not move down into tubers as other nutrients.
- Ca uptake by tubers only through stolon and tuber itself.

Therefore, the only way to feed Ca to tuber is to apply Ca to there where the stolon and tubers is---water soluble form.

## Secondary nutrient in water soluble fertilizer





## Secondary nutrients in water soluble fertilizer

### **CAN.MAG 13-0-0+16CaO+6MgO.**

- Supply Ca, Mg and N in one product.
- The rate of Ca and Mg nearly 3:1, coincide with the requirement ratio of these 2 nutrients by potato crop.
- With nitrate N, which can promote the absorption of cation Ca and Mg.

## Application

- 100% water soluble, easy to be apply through fertigation and foliar application.
- Fine and hard light blue granules, can also be applied by broadcast sprayer.



## Field trial



## Field trial-Introduction

### **Located in Chayouzhongqi County, Inner Mongolia**

- Treatment and Control :Same nutrient application volume
- CAN.MAG supply Ca, Mg and some N in the Treatment.
- SSP in base and Magnesium Sulphate in fertigation to supply Ca, Mg in the Control.

## Field trial-application

- Apply once every 10 days.
- Start from the tuber initiation.
- 150kg per ha. each time.
- Total amount CaO : 48kg & MgO : 18kg per ha.

## Field trial- result

### Results and Benefits:

- Yield increased by 12mt/ha.
- Decrease the IBS rate by 14%
- Tuber bruising is 25% less.
- Soft rot in warehouse is 34% less



End

**Thanks for your time**