

**Nutrient Deficiency Symptoms in Maize Crop****Wale V. D.<sup>1</sup>, Patil P.V.<sup>2</sup>, Shete S.A.<sup>1</sup>, Bangar K.D.<sup>1</sup> and Gajbhiye S.K.<sup>1</sup>**<sup>1</sup>Assistant Professor, College of Agriculture, Maldad, Sangamner, Ahmednagar, (M.S.)<sup>2</sup>Research Scientist, PI, Industry Ltd, Udaipur, Rajasthan**SUMMARY**

Maize is usually considered to have a high soil fertility requirement to achieve maximal yields. The deficiency of macro and micro nutrient leads to reduce growth and yield of Maize crop. These nutrient deficiency symptoms are appears on new leaves, old leaves and some time on stem of the plants. To reduce losses in yield, it is very important to diagnose these nutrient deficiency symptoms and application of a particular nutrient to meet crop requirements. Soil testing and tissue analysis should be used to corroborate nutrient levels in the soil and the plant.

**INTRODUCTION**

Nutrient has an important effect on nutrition. Macro and microelements such as Ca, S, Mg, K, N, P and Fe have so far been recognized as essential for plants. Plants cannot complete their life cycles and accomplish their physiological functions in the absence of these nutrients. Their deficiencies reduce growth and yield of crops (Binder, et. al. 2000; Osman, 2013). Deficiencies of individual nutrients affected significantly the photochemical processes of photosynthesis (Kalaji et. al. 2014). It is important to find a correct balance between macro and micronutrients for maize crops. Nutrients in the soil are taken up by the roots after which they are translocated within the plant reaching the stems and leaves. Decreased water availability in the soil reduces the movement of the nutrients in which, plant growth is hampered. Plant nutrients can be classified as mobile and immobile within the plant. Mobile Nutrients are translocated from old tissues to young tissues within the plant. Therefore, Symptoms of nutrient shortage are noticeable first on lowest, oldest leaves. E.g. N, P, K, Mg. Immobile Nutrients are not easily transferred within the plant. Therefore, symptoms of nutrient deficiency occur first on upper, youngest leaves. e.g. Fe, S, Ca, Cu, Zn, Mn, Mo, B.

**Nitrogen**

Plants suffering from nitrogen tend to show yellow or light-green young plants, often stunted, Dramatic yellowing of oldest/lowest leaves, particularly at the tips and centers of leaves, and Cobs with tips lacking grain. The oldest leaves show yellow discoloration and necrosis starting at the tip of the leaf.



Low or high pH soils make the problem worsen. N is important for lush green growth. It contributes towards yield, grain quality. Maize plant requires nitrogen and phosphorous soon after germination to stimulate the growth of stems, leaves and ear. The majority of nitrogen is needed during the growth.

**Phosphorus**

Young plants suffering from P are stunted & thin with dark green leaves. Leaf margins, veins and stems show tinges of purple which may even spread across the whole blade of the leaf. This reddish discoloration is visible mainly in the juvenile stage. Acidic and alkaline soils worsen the plants. It is very important to ensure good plant growth.





**Potassium**

The cobs of plants which have been deficient in K are noticeably narrowed. The grain on the tips of the cobs will be poorly filled. The problem is worsened in acidic and light soils which leach K very easily and quickly. Drought condition and high rainfall or heavy irrigation is equally problematic. K is important for green foliage and ensures optimal root growth, which contributes towards yield.



**Magnesium**

Symptoms of Mg shortage seen in the leaves having red and purple tints with streaky appearance. Yellowing of leaf tips and move intervenally toward the base and midrib, giving a typical herringbone appearance. This often occurs in extended periods of cold and wet in soils which are acidic or sandy. Mg contributes towards healthy plant and improves yield.



**Calcium**

Due to Calcium shortage, youngest leaves remain rolled and joined together at their tips, which exhibit a light green colour or even whitish spots or streaky lesions and even be hooked back.





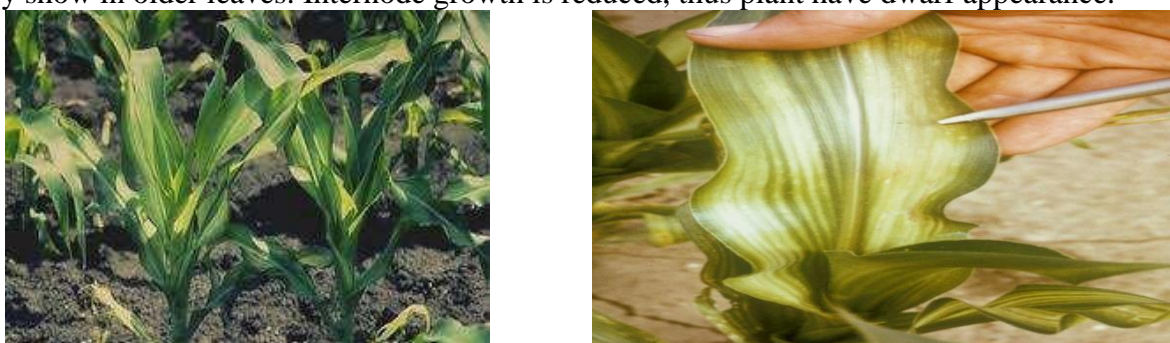
## Sulphur

The maize plant will seem stunted and erect appearance when sulphur is in short supply. Sulfur deficiency causes a general yellowing of the foliage, similar to nitrogen deficiency, and may appear during rapid plant biomass accumulation. Yellowing of the younger upper leaves is more pronounced with sulfur deficiency than with nitrogen deficiency because sulfur is not easily translocated in the plant. These worsen in acidic soils as well as light, sandy soil. It is also exacerbated by soils with low levels of organic matter or if the soils are poorly aerated or waterlogged. Sulphur contributes to green foliage, healthy growth and contributes to an effective uptake of nitrogen by the crop. (Pale green upper leaves and darker lower leaves).



## Zinc

Zinc deficiencies seen in the leaves of the maize plant has pale yellow zones which start at the base of the leaves and run up the sides of the midrib while the leaf margin, tip and the midrib stay green. These symptoms generally show in older leaves. Internode growth is reduced, thus plant have dwarf appearance.



## CONCLUSION

To achieve top potential yield in maize crop, it is important to take regular soil samples for analysis. On the basis of the information obtained, apply the correct dose of fertilizers according to the recommendations. Both soil testing and tissue analysis should be used to corroborate nutrient levels in the soil and the plant. Both Macro and Micro-nutrients play a very important role in the life cycle of a maize plant.

## REFERENCES

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