2015 Crop Nutrient Deficiency Photo Contest Winners

IPNI is once again pleased to announce the winners of the 2015 Crop Nutrient Deficiency Photo Contest.

Many excellent examples of crop nutrient deficiency were received across all four of our contest's categories. Preference was given to well-photographed entries that provided a good representation of the impact of the deficiency to the whole plant, adequate nutrient analyses information, and details concerning current or historical fertilization at the site.

IPNI thanks all participants for their submissions to this annual contest. By providing these excellent examples of docu-mented nutrient deficiencies in crops, you are contributing to our mission to increase awareness on their diagnoses and treatment.

Many congratulations to all of this year's winners who, in addition to their cash award, will also be receiving a complimentary version of our most recent USB flash drive collection of crop nutrient deficiency images. For more details on this collection please see: http://ipni.info/nutrientimagecollection.

We encourage all participants to check back regularly with the contest's website maintained at www.ipni.net/photocontest for details on submitting your entries for 2016.

Featured Category (Root and Tuber Crops)

First Prize (US$300) – Phosphorus Deficiency in Turnip – Jaume Cots Ibiza, BC Fertilis, Valencia, Spain. This image from Spain captured a vivid example of P deficiency in turnip. Note the purple color of the leaves and slow growth of the entire plant, especially the youngest leaves. Turnips were grown in loamy soil (pH 7.4) with high K content (340 mg/kg - photometric method) and low P content (5 mg/kg – Olsen).

Second Prize (US$200) – Phosphorus Deficiency in Sweet Potato – S. Srinivasan, Tamil Nadu Agricultural University, Tamil Nadu, India. This is a noticeable example of P deficiency in a three-month-old sweet potato plant grown on black calcareous soil near Kovil-patti, Tamil Nadu. The plant received no P after planting. Under acute deficiency, the younger leaves can also develop inter-veinal purple pigmentation on the upper surface. The soil test (Olsen-P) revealed that P content was very low (less than 1.3 mg P/kg). Leaf tissue analysis also registered a lower value of 0.05% P.

Nitrogen Category

First Prize (US$150) – Nitrogen Deficiency in Potato – Daniel Geisseler and Patricia Lazicki, University of California, Davis, California, USA. Taken in a "no-fertilizer" plot of a cover crop experiment at the Intermountain Research and Extension Center in Tulelake, California. Average soil nitrate-N in the top 10 inches of soil prior to planting was 14 ppm. Adjacent plots, which had had a woolypod vetch cover crop tilled-in, had an initial soil nitrate-N of 28 ppm. Potatoes in these plots were markedly greener.

Second Prize (US$100) – Nitrogen Deficiency in Palm – N.D. Yogendra, University of Agricultural and Horticultural Sciences, Shivamogga, Karnataka, India. A close-up N deficiency in Areca palm leaves shows yellowing of older leaves, which is progressing to younger leaves. During the later stages of growth, drying of leaf tips was observed. The soil texture was sandy loamy and soil pH was 5.7. Tissue analysis of leaves conformed N deficiency, affected leaves N content was found to be low 1.58%. Available N (alkaline $KMnO_4$) was also low (190 kg/ha).

Abbreviations and Notes: N = nitrogen; P = phosphorus; K = potassium; Ca = calcium; Mg = magnesium; CEC = cation exchange capacity.

Phosphorus Category

First Prize (US$150) – Phosphorus Deficiency in Corn – Jason Kelley and Morteza Mozaffari, University of Arkansas, Arkansas USA. Soil samples (0 to 4 inches) taken from this P deficient field at Lon Mann Cotton Branch Research Station, in Marianna, Arkansas had a Mehlich-3 extractable P of 17 ppm (low). Weather conditions after corn planting and emergence had been cool and wet that likely reduced root growth and P uptake, increasing visual symptoms of P deficiency. As growing conditions improved and the plants root system became larger, deficiency symptoms disappeared without additional P fertilizer.

Second Prize (US$100) – Phosphorus Deficiency in Sugarcane – M. Dhasarathan, Tamil Nadu Agricultural University, Tamil Nadu, India. Profound P deficiency in a local cultivar of sugarcane growing in a farmer's field in near Salem, Tamil Nadu, India. A strong reddish-purple margin occurred in the older leaf. Soil and plant analysis both showed low soil (20 kg/ha) and leaf (0.09%) P contents—lower than normal levels near 75 kg/ha and 0.3%, respectively.

Potassium Category

First Prize (US$150) – Potassium Deficiency in Corn – Jason Kelley and Morteza Mozaffari, University of Arkansas, Arkansas USA. This field near Lon Mann Cotton Branch Research Station, in Marianna, Arkansas had not had any K fertilizer applied in several years. The corn plants were also hampered by shallow root systems due to soil compaction, which further reduced the amount of K available to the plant. Soil samples (0 to 4 inches) from the area showing K deficiency had a Mehlich-3 extractable K of 78 ppm (low). Potassium deficiency symptoms were present season long without any additional K fertilizer.

Second Prize (US$200) – Potassium Deficiency in Groundnut – Gopal Ramdas Mahajan, ICAR - Central Coastal Agricultural Research Institute, Goa, India. Taken at Tiruchirapalli, Tamil Nadu, typical yellowing of the older leaves, starting from the margins, has progressed towards the midribs in this flowering groundnut crop. The crop was grown on acid upland (14% slope, lateritic, pH 5.8) soil. The soils were deficient in the basic cations and had very low soil available K (61 kg/ha). Total leaf K content in the deficient leaves was only 0.6%, whereas it was 1.8% in the healthy crop grown in the level lowland at the base of the slope.

Other Category (Secondary and Micronutrients)

First Prize (US$150) – Magnesium Deficiency in Corn – Jason Kelley, University of Arkansas, Arkansas USA. Magnesium deficiency was found in a non-irrigated corner of a pivot-irrigated corn field near Augusta, Arkansas. The site's soil was sandy with a CEC of 7.9 cmol/kg. Soil analysis from a 4-inch sample at tasselling stage showed a pH of 4.1 (1:1 method) and a soil Mg level of 26 ppm. Tissue samples collected from ear leaves at tasselling indicated a Mg concentration of 0.07% and all other nutrients were considered sufficient.

Second Prize (US$100) – Magnesium Deficiency in Papaya – Mavinakoppa S. Nagaraja, University of Horticultural Sciences, Bagalkot, Karnataka, India. Papaya plants found at Bagalkot, Karnataka are showing the Mg deficiency symptom of interveinal chlorosis of older leaves. Younger leaves appear normal, which indicates mobilization of Mg within the plant system. The site's calcareous soils are known to produce Mg deficiency unless external sources are applied. Soil analysis found a wide ratio of Ca:Mg (13:1) with 0.68 cmol Mg/kg soil compared to 8.82 cmol Ca/kg soil. Petiole analysis of normal and deficient plants also suggested Mg deficiency (0.33% in healthy plants; 0.17% in deficient plant).