

2016 Crop Nutrient Deficiency Photo Contest Winners

We thank all participants for their submissions and extend special congratulations to our group of winners who, in addition to their cash award, will also be receiving our most recent USB flash drive collection featuring hundreds of images. For more details on this col-

lection please see: <http://ipni.info/nutrientimagecollection>.

Our 2017 contest is almost ready to begin to accept new entries and we encourage everyone to check back regularly with the contest's website www.ipni.net/photocontest for details on how to make a submission. Best of luck!



Best Overall Image

First Prize (US\$250) – Phosphorus Deficiency in Chickpea – Dr. Srinivasan Subbiah, Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu, India

Dr. Subbiah took this close-up image of P deficiency in chickpea growing near Coimbatore. Taken during the crop's flowering stage, the deficiency appears with its characteristic purpling of leaves. Leaf purpling appeared first in the lower leaf tips and progressed along margins. Under acute conditions, the red-purple color spreads up the stems. "Plants were obviously stunted and ultimately resulted in a low yield," explained Dr. Subbiah. Root growth was also greatly reduced. The plants received no P after sowing and field had a long history of monocropped corn. Soil pH was 8.3. The soil test (Olsen-P) revealed that soluble levels of P were very low (less than 1.2 mg P/kg). Whole shoot analysis also registered a relatively low value of 0.14% P.



Nitrogen Category

First Prize (US\$150) – Nitrogen Deficiency in Tobacco – Dr. Brian Whipker, Floriculture Group, Dept. of Horticultural Science, North Carolina State University, Raleigh, USA. Dr. Whipker setup a controlled study utilizing silica sand and technical grade fertilizer salts and induced this severe N deficiency in tobacco. The plant had a full array of classical symptoms. The oldest leaves turned necrotic, while the next leaf set had an overall yellowing and bleached appearance. Light green to yellow foliage occurred on young leaves just beginning to show symptoms. The upper foliage, was light green and stunted due to N being withheld.

Second Prize (US\$100) – Nitrogen Deficiency in Raspberry – Ms. Cristina Pulido Gilabert, Oliva (Valencia), Spain. Ms. Pulido found this example of N deficiency being expressed on a fruit-bearing portion of the plant. The deficiency is visible within the photo frame, but not in other portions of the plant since the development of fruits exerted a higher local demand for N from the immediately surrounding area.



Abbreviations and Notes: N = nitrogen; P = phosphorus; K = potassium; Mg = magnesium; B = boron; Fe = iron; CEC = cation exchange capacity.

Phosphorus Category



First Prize (US\$150) – Phosphorus Deficiency in Corn – Mr. Jim Valent, State College, Pennsylvania, USA. Taken near Limington, Maine, USA, Mr. Valent captured this vibrant expression of P deficiency in corn (near V4 stage). His example provides an example of the impact of soil pH on P availability. Soil samples were taken both near these purple plants and other greener plants nearby. Results showed purple plants were growing in soil with lower pH and CEC, but soil test P concentrations were similar. Distinctly purple corn had low leaf tissue P of 0.16% P, which was half the values measured for green corn. Leaf Fe and Al were well above normal concentrations in the P-deficient plants.

Second Prize (US\$100) – Phosphorus Deficiency in Coffee – Mr. Rodolfo Lizcano, Baraya, Huila, Colombia. Mr. Lizcano spotted this case of P deficiency on a coffee (arabica) plant in the midst of its fruit-filling stage. The crop was growing on Oxisol soil, which commonly have pH values under 5 and have a high potential for excessive Al availability ...in this case a high Al saturation of 60%.

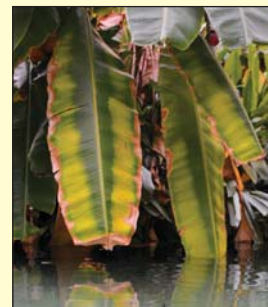


Potassium Category



First Prize (US\$150) – Potassium Deficiency in Turmeric – Mr. Udaya Kumar, Dept. Soil Sci. and Ag. Chem., Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu, India. Mr. Kumar provided a “crisp” example of K deficiency in a two-month-old turmeric crop near Coimbatore, Tamil Nadu. Plants showed reduced growth, shortened inter-nodes, marginal burning (brown leaf edges) and necrotic spots in the older leaves and burning marched towards younger leaves due to severe deficiency. Both the soil analysis and plant tissue analysis showed low concentrations of K (42 ppm and 2.1%), respectively. The deficiency was corrected by application of a 1% potassium sulfate (K_2SO_4) source applied by foliar spray at 14-day intervals.

Second Prize (US\$100) – Potassium Deficiency in Banana – Dr. Vinicius Benites, Rio Verde, Goiás, Brazil. Dr. Benites shot this image near Mateiros, Tocantins, Brazil, where a temporarily flooded banana plantation had plants showing the distinct marginal scorching of leaves that is associated with K deficiency. “This extreme case was induced by a cation imbalance due to an excess Mg concentration in the flood waters,” explains Benites.



Other Category (Secondary and Micronutrients)



First Prize (US\$150) – Iron Deficiency in Cashew – Mr. Boopathi Raja, Agricultural College and Research Institute, Madurai, Tamil Nadu, India. This image from a farm field in the Madurai District of Tamil Nadu shows extensive Fe deficiency symptoms on two-year-old cashew plants. “The young leaves showed interveinal chlorosis that progressed to the plant-wide yellowing captured in this photo,” explains Mr. Raja. Both soil pH (8.3) and exchangeable sodium percentage (20%) were high. Available soil Fe was 1.7 ppm (DTPA-extractable) and Fe concentration within plant dry matter was 20 ppm.

Second Prize (US\$100) – Boron Deficiency in Cassava – Dr. Susan John Kuzhivilayil, Indian Council of Agricultural Research-Central Tuber Crops Research Institute, Thiruvananthapuram, Kerala, India. While scouting this 3-month-old cassava crop being grown on an acid ultisol, Dr. Kuzhivilayil spotted the typical broom-like appearance associated with B deficiency. “The apical part of the plant’s leaf and stem were distinctly deformed, which limited any normal development of nearby leaves,” explained Kuzhivilayil. Affected plant’s will often have a healthy appearance elsewhere; however, in severe stages the crop will get stunted.

