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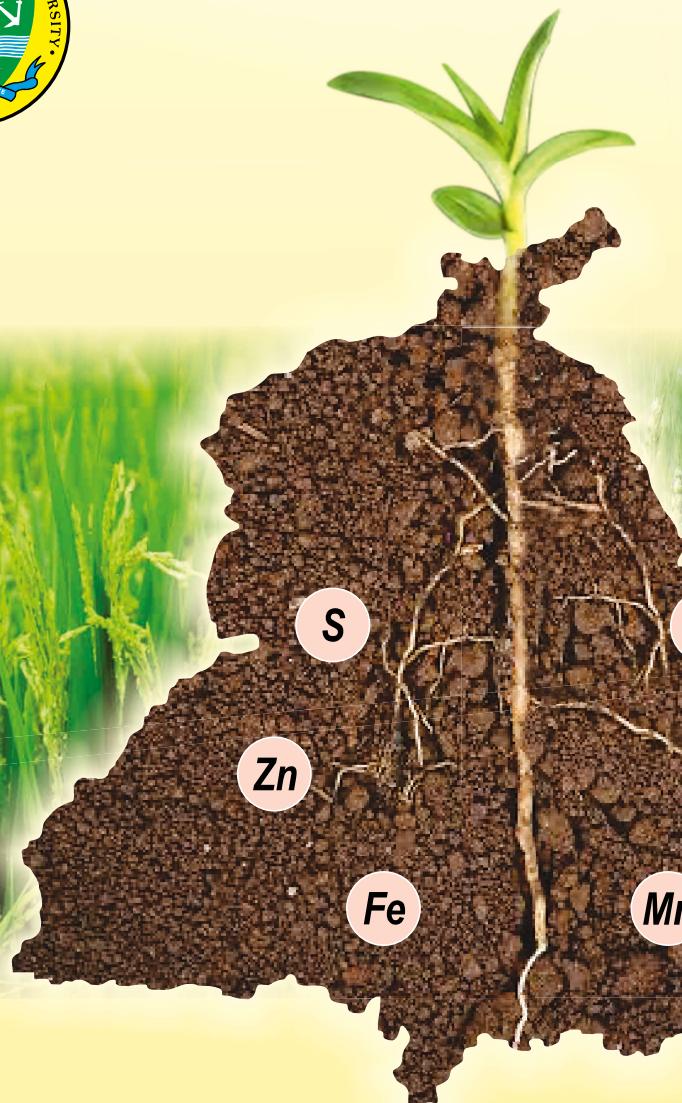
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STATUS OF SULPHUR AND MICRONUTRIENTS IN SOILS OF PUNJAB – BLOCKWISE ATLAS



**All India Coordinated Research Project
on
Micro and Secondary Nutrients and Pollutant Elements in Soils and Plants**

Department of Soil Science, Punjab Agricultural University, Ludhiana-141004

ICAR-Indian Institute of Soil Science, Bhopal-462038

2020

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B

Cu

Mn

Fe



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SUMMARY

For the first time, the Department of Soil Science, Punjab Agricultural University, Ludhiana, in collaboration with Indian Institute of Soil Science, Bhopal, prepared soil maps of Punjab state under the aegis of “**ICAR-All India Coordinated Research Project on Micro and Secondary Nutrients and Pollutant Elements in Soils and Plants**”. Based on nutrient delineation mandate, more than 7200 surface soil samples (0-15 cm) were collected from 22 districts of state using global positioning system (GPS) and these samples were analyzed for micro and secondary nutrients. On the basis of GPS locations and soil samples data, an atlas was developed containing maps showing status of micro (B, Zn, Cu, Fe and Mn) and secondary (S) plant nutrients of each district upto block levels. The status of available S, Zn, Fe, Cu, Mn and B nutrients in soils of Punjab is summarized below:

Sulphur: In the state on an average, nearly 3.5 per cent soil samples of the state were found to be acute deficit in available sulphur ($< 7.5 \text{ mg kg}^{-1}$). However, the 21.7 per cent samples were found to be high in available sulphur ($>40.0 \text{ mg kg}^{-1}$). Among different districts, deficiency of available sulphur was observed to be severe in districts Rupnagar (29.1%) and Amritsar (29.7%), respectively. The districts Fazilka and Faridkot have 99.7 and 96.6 per cent soil samples high in the available sulphur content ($> 40.0 \text{ mg kg}^{-1}$).

Zinc: The deficiency of DTPA extractable zinc in soils of different districts of Punjab varied from 0-36.2 per cent with an average value of 12.1 per cent. The deficiency of DTPA extractable zinc ($<0.6 \text{ mg kg}^{-1}$) was found to be highest in Hoshiarpur district of Punjab (36.2%) followed by Rupnagar (33.6%), Gurdaspur (33.1%), Fazilka (25.4%) and SBS Nagar (23.8%), respectively. On an average 30.4 per cent soil samples of state was found to be higher in DTPA extractable zinc ($>1.8 \text{ mg kg}^{-1}$), which was highest in district Fatehgarh Sahib (97.4%) followed by Moga (85.0%) and Barnala (58.5%), respectively.

Iron: In case of DTPA extractable iron, on an average 9.7 per cent of soil samples in the state were found to be deficit in DTPA-Fe ($<4.5 \text{ mg kg}^{-1}$), however, 67.6 per cent of soil samples was found higher in DTPA-Fe ($>10.5 \text{ mg kg}^{-1}$). Among different districts, Kapurthala, Fazlka and Bathinda have 52.1, 45.6 and 42.5 per cent of soil samples deficit in DTPA-Fe ($<4.5 \text{ mg kg}^{-1}$).

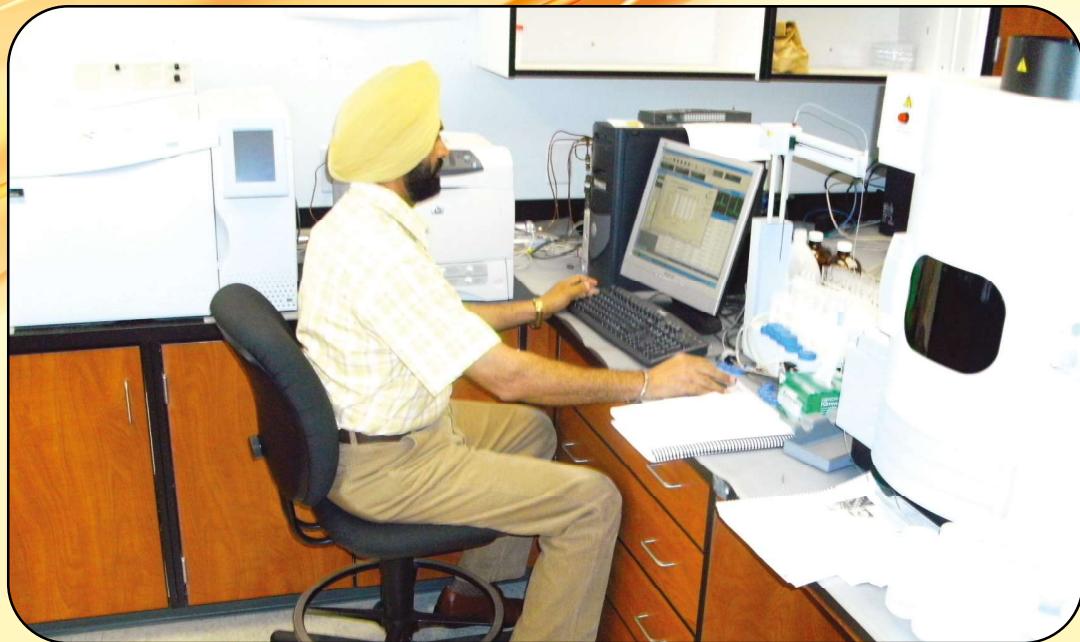
Copper: Copper deficiency in soils of Punjab varied from 0 to 17.3 per cent with an average value of 4.5 per cent. The district Bathinda and Hoshiarpur showed highest copper deficiency of 21.6 and 10.1 per cent, respectively. However, the Fatehgarh Sahib, Amritsar, Kapurthala and Moga have 100, 98.1, 96.6 and 96.2 per cent of soil samples having copper content more than 1.0 mg kg^{-1} , respectively.



Manganese: The deficiency of manganese was found to be severe in the soils of Punjab and it varied from 0-73.6 per cent with an average value of 25.5. The deficiency of manganese was found to be severe in district Fazilka (73.6%) followed by Bathinda (59.2%), Barnala, (58.9%), Ludhiana (45.2%) and Sangrur (36.0%), respectively. However, Pathankot, Patiala and Kapurthala districts have 95.4, 79.6 and 76.4 per cent of soil samples with high manganese content ($> 9.0 \text{ mg kg}^{-1}$).

Boron: The deficiency of available boron in soil varied from 0 to 51.0 per cent with average value of 12.1 per cent. The deficiency of boron was severe in district Jalandhar (51.0 %), followed by Sangrur (35.1 %), Hoshiarpur (19.5 %) and Patiala (18.0 %), respectively.

The results of our study depicted that with the advent of high yielding crop cultivars, the nutrient status of soils of state is depleting. This also suggested us to redefine fertilizers recommendations and critical limits of some of micronutrients for different crops. Last but not least, the soils should be delineated after regular intervals for updation of soil fertility maps for making new recommendations under existing soil conditions.



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AICRP Micro Nutrient Team, Punjab Agricultural University, Ludhiana along with Trainees

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