In the Name of Allah, the Merciful the Beneficent

Soil Science News

Quarterly Newsletter of Soil Science Society of Pakistan

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EDITORIAL

Soil Nutrient Balances: A Tool for Soil Fertility Management

Agricultural intensification and continuous cropping, without adequate restorative practices, may endanger the sustainability of agriculture. In fact, nutrient depletion is a major form of soil degradation and threat to agricultural sustainability. A quantitative knowledge of plant nutrients depletion from soils is useful for understanding the state of soil degradation and serves as instrument to provide indicators of the sustainability of agricultural systems.

A simple specification of the balance of nutrients could be given by the following equation:

$$Rn_{tn} \quad {}^{tn} \quad AP_t \quad AR_t \quad RM_t \quad L_t$$

where: Rn_{tn} is the quantity of inorganic and organic nutrients remaining in the soil at time *tn*; AP_t is the soil inorganic and organic nutrients present at time *t*; AR_t is the inorganic and organic nutrients added or returned to the soil during the time interval *t*. The RM_t estimate is the plant nutrients removed with the harvested product and residue management during the time interval *t*, and L_t is the inorganic and organic nutrients lost during the time interval *t*. The value of *t* represents the beginning time period, *tn* represents the ending time period, and *t* is the time interval between *t* and *tn*.

The equation states that if the amounts of nutrients removed from the soil (outflows) are greater than the additions (inflows), either by fertilization or management practices, then the reservoir or stock of nutrients within the soil pool will decline. Exact determination of different soil nutrient pools is not possible because of the complex dynamics and stochastic nature of nutrient transformation processes prevalent in the soil system.

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NEWS AND VIEWS

Soil Science Society of Pakistan's Symposium: Plant Nutrition Management for Horticultural Crops under Water Stress Conditions

The Soil Science Society of Pakistan, in collaboration with Pakistan Science Foundation and Department of Agriculture, Government of Balochistan, organized a 2-day symposium on "Plant Nutrition Management for Horticultural Crops under Water Stress Conditions" on October 5 6, 2004 at ARI, Quetta.

The Society held this special symposium in Quetta because a number of agricultural research institutions (provincial/federal) located there are addressing horticultural research, and Baluchistan is called the fruits. It was a unique opportunity for the national and

From left to right: Dr. Nisar Ahmad, Muhammad Riaz Khan, Dr. K.S. Memon, and Dr. Amanullah Bhatti, at the Inaugural Session of the Symposium

'Fruit Garden of Pakistan' producing finest quality 'Fruit Garden of Pakistan' – producing finest quality fruits. It was a unique opportunity for the national and Baluchistan scientists to exchange their research experiences/information. The participants also had the opportunity to observe and know about Baluchistan agriculture in a unique set of coastal, subtropical, semiarid and arid environmental.

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Evaluation of Mycorrhizal Pore Density and Colonization in Roots of Various Crops.

Dr. Muhammad Sharif, Assistant Professor, Department of Soil and Environmental Sciences, NWFP Agricultural University, Peshawar studied spore density and mycorrhizal colonization in 25 rhizosphere samples of some selected soils and plant roots from fertile and marginally fertile soils of North West Frontier Province of Pakistan. All tested plants are observed to be mycorrhizal. High number of mycorrhizal spores (>4000 spores kg^{-1} soil) were found in potato, barley, rice and chickpea in fertile soils. Other crops, like alfalfa, wheat, oat and grasses also contain high number of spores in marginally fertile soils. Root infection levels in these crops varied from site to site. Barley, potato and oats exhibited high infection rates (i.e., 44, 40 and 33%, respectively) in well managed fertile soils. In barley, alfalfa and wheat, mycorrhizal infections rates were 52, 50 and 43% respectively in marginal soils. Generally, spore density in soils seemed to be dominated by the species of *Glomus fasciculatum*. However, spores of *Glomus intraradices* and *Glomus mosseae* were also identified in the samples. Soils under investigation have pH ranging from 5.6 to 8.5 with low concentration of available phosphorus and high content. The study revealed that vesicular-arbuscular mycorrhizal fungal spores and root colonization varied in different crops from site to site under different agro-ecological conditions.

Renewal of Membership

Society's membership fee for the year 2005 is due. All regular members are requested to renew their membership by paying Rs. 200/. Those who are interested to become a new regular member, please pay Rs 400/- (Rs. 200/- registration fee +Rs. 200/- annual fee) or Rs. 2000/- life membership cash, or by pay order/bank draft (checques not acceptable) to: ***Dr. M. Tariq Siddique***, Treasurer, SSSP
AAC, Soil & Water Testing Laboratory, Data Ganj Bakhsh Road, Rawalpindi.
Tel: (051) 4841395 ***E-mail***: mt_siddique1@yahoo.com.

PROMOTIONS, APPOINTMENTS, POSTINGS,

Professor Dr. Raiz Hussain Qureshi, Vice Chancellor (Retd.), University of Agriculture, Faisalabad, has been appointed as Advisor (Quality Assurance & Learning Innovation) in Higher Education Commission, Islamabad.

Dr. Haji Khan Kerio, Director, National Sugar Crops Research Institute, Makli, Thatta, has been appointed Director General, Agricultural Research, Government of Sindh, Hyderabad.

Prof. Dr. Shahbaz Ahmad, Chairman,Department of Agronomy, Arid Agri. Univ., Rawalpindi, a life member of SSSP, has been appointed Dean, Faculty of Crop and Food Sciences for a period of three years.

Dr. Ghulam Jilani *and* ***Dr. Khalid Saifullah,*** Assistant Professors have been promoted as Associate Professor Soil Science, University of Arid Agriculture, Rawalpindi.

Mr. Riaz Ahmad Sial, Assistant Agricultural Chemist, Hafizabad, ***Mr. Muhammad Younas,*** Assistant Agricultural Chemist, Fodder Research Institute, Sargodah And ***Mr. Akhtar Hussan Shah*** Assistant Soil Fertility Officer, Rawalpindi have been promoted as Agricultural Chemist and posted at Pesticide Instt., Fasialabad, Biochemistry Section, AARI, Faisalabad and Soil Fertility Instt. Lahore, respectively.

Mr. Zameer Hussain, Asstt. Agri. Chemist (Soils) has been assigned additional charge of Agricultural Chemist (Soils), Agricultural Research Institute, Tarnab, Peshawar

Sindh government has awarded 40 % Selection Grade BPS-18 to Soil Scientists working in BPS-17.

Congratulations to all from Soil Science News!

VISITS AND FELLOWSHIPS

Dr. Muhammad Sharif, Assistant Professor, Department of Soil and Environmental Sciences, NWFP Agricultural University, Peshawar has resumed charge after completing three-month training on spore density and mycorrhizal colonization at the Institute for Crop and Animal Production in Tropics and Subtropics, George-August-University of Goettingen, Germany sponsored by German Academic Exchange Services (DAAD).

Dr. Ghulam Jilani, Associate Professor, Department of Soil Science, Univ. of Arid Agriculture, Rawalpindi has been awarded HEC post-doctoral fellowship on Soil Microbiology. He will spend post-doctoral period in USA.

Dr. Khalid Saifullah, Associate Professor, Soil Science, has been awarded HEC post-doctoral fellowship on Nutrient Cycling and Carbon Mineralization in Germany.

RESEARCH GRANTS

Prof. Dr. Muhammad Jamal Khan, Department of Soil and Environmental Sciences, NWFP Agricultural University, Peshawar, has received the following two research grants:

1: Beneficial reuse of waste water as a resource for crop production, funded by Higher Education Commission, Islamabad.

2: Enhancing wheat yield on salt affected soils, funded by Pakistan Science Foundation,

RETIREMENTS

Dr. M. Mohsin Iqbal, Chief Scientist/Director, NIAB, Faisalabad has retired on 26th October, 2004. Earlier, he had served PAEC as Head, Soil Science Division, NIA Tandojam; Head, Nuclear Agriculture Division/Director, NIFA, Peshawar. His areas of specializations are soil fertility, plant nutrition and soil water. He has >200 publications and has represented Pakistan at many international conferences.

Dr. Iqbal, a life member of SSSP, has served the Society as President, Vice President and Councillor. Presently, he is Chief Editor, Pakistan Journal of Soil Science. Dr. Iqbal is a recipient of Star Award 2002, Star Laureate Award, and Tamgha-e-Baqa.

Dr. Anwar Ali Jakhro, Professor, Department of Soil Science, Sindh Agriculture University, Tandojam has retired on December 31, 2004 on superannuation.

Mr. Noor-ul-Rehman, Agricultural Chemist (Soils), Agri. Research Institute Tarnab, Peshawar has retired in Oct. 2004. He started his research career in 1967 as Research Officer, Chemistry Section, ARI Tarnab, Peshawar.

Mr. Muhammad Siddique Hamdard has retired from the post of Agricultural Chemist (Bio) after reaching the age of superannuaion.

We pray for their good health and prosperous retired

OBITUARY

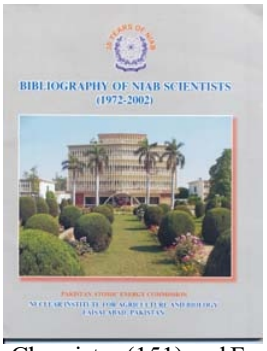
Prof. Dr. Abdul Ghafoor Chairman, Department of Horticulture, Faculty of Agriculture, Gomal University D.I. Khan, a life member of SSSP, has expired on 23.10.2004 due to illness اِنَّاللہِ وَاِنَّاۤ اِلَیۡہِ رٰجِعُوۡن .

Dr. Ghafoor was an honest, sincere, dedicated and productive scientist. He will be remembered by his colleagues.

We pray for the departed soul.

PUBLICATIONS

Bibliography of NIAB Scientists. I. Haq, G. R. Tahir and M. M. Iqbal (editors), Nuclear Institute for Agriculture & Biology, Faisalabad, 2004.



The bibliography has enlisted 1152 publications during the last three decades (1972 2002). The research results reported in the document pertain to disciplines of Plant Breeding (198), Plant Molecular Breading (62), Soil Salinity (180), Plant Nutrition (335), Entomology (36), Plant Pathology (92), Biological Chemistry (151) and Food Preservation (98).

We foresee extensive use of this document by graduate students, researchers and consultants for re-orientation of research activities for solving plant breeding, soil & environmental stresses, plant protection and food science & nutritional issues of national & regional importance.

Abstracts of the Symposium on *Plant Nutrition Management for Horticultural Crops under Water Stress Conditions*. October 5 6, 2004, Soil Science Society of Pakistan. 21 pp. The publication contains 42 abstracts addressing various aspects of stress limiting horticultural crops production. The abstract book is a handy source of up-to-date information about the Stresses affecting productivity and ways for wise management of limited soil and water resources for horticultural crops. This documentation can provide guidelines to planners/policy makers for the improvement of horticultural crops production in Balochistan and elsewhere in the country.

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Soil Nutrient Balances: A Tool for Soil Fertility Management

Thus, based on a number of assumptions, nutrient-balance studies provide rapid findings, based on a short time-frame exercise. Even then, nutrient-budgets and nutrient-balance sheets have been applied widely in recent years at a variety of levels, i.e., plot, farm, regional, national and continental, and have revealed widespread occurrence of nutrient mining and soil fertility decline. However, questions remain concerning whether nutrient budgets provide the information required for understanding the status and dynamics of soil fertility across farming systems and whether such analysis may provide reliable direction and support to policy formulation on soil fertility management.

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Soil Science Society of Pakistan's Symposium: Plant Nutrition Management…

A large number of local, national and international agricultural scientists attended the seminar. During this 2-day symposium various aspects of stresses limiting

A Symposium Session in Progress

horticultural crop production were discussed in more than 40 oral presentations in different sessions.

Recommendations

A Recommendation Committee, comprising of senior soil scientists/agronomists of various agricultural institutes, formulated following recommendations based on the presented papers and the accompanying discussions during the 2-day symposium deliberations.

1. Well-planned long-term horticultural-plant nutritional experiments should be initiated in all provinces under a National Coordinated Programme involving Plant Nutritionists.
2. Keeping in view the scarcity of water, comparative efficiency of various irrigation methods for horticultural crops under different agro-climatic conditions should be carried out to determine water requirement on scientific basis.
3. Keeping in view the importance of farm yard manure for improving & sustaining soil productivity, its effective utilization must be exploited to meet the requirements and high delta values of green manuring corps, composting potential of organic wastes, viz. city, industrial and farm wastes to meet the requirements of orchards.
4. There is a great need of research on calibration and Analysis with yield for establishing nutrients critical levels for horticultural crops under local conditions.
5. Fertigation is a relatively new technology and has not been well established. Thus, research is needed on different aspects of fertigation under different agro-climatic conditions.
6. There are no clear results of foliar feeding of horticultural crops, thus call for further research to find out the merits and demerits of foliar nutrition of horticultural crops under different conditions.
7. Keeping in view the scarcity of irrigation water, research on low delta crops, i.e., almond, pistachio, grape and pomegranate should be conducted.
8. Research and promotion of olive and oilpalm cultivation in all rainfed areas and different agro-econological zones suitable for these crops, especially in Balochistan, should be carried out for these crops so that marginal lands are brought under cultivation.
9. Processing and extraction units for olive and oilpalm should be established by the time crops become productive.
10. Humic acid (HA) can be used as organic manure. Agro-potential of HA should be exploited for horticultural crops.

Special Announcement

All Society members are requested to provide their current mailing addresses for an effective communication between the Society and its honorable members. The mailing address may please be sent to:

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