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## **Executive Council, ISA**

<b>President</b>	: Dr AK Vyas
<b>Vice-President</b>	: Dr VK Singh
<b>Secretary</b>	: Dr YS Shivay
<b>Joint Secretary</b>	: Dr PS Bodake
<b>Treasurer</b>	: Dr Ashok Kumar
<b>Editor-in-Chief</b>	: Dr TC Jain

## Message



It is a matter of great pleasure and satisfaction for all of us that we have successfully initiated the publication of Indian Society of Agronomy Newsletter and received the Messages and blessings from stalwart Agronomists and past Presidents of ISA like Dr Ambika Singh, Dr P S Lamba, Dr G B Singh, Dr A S Faroda and Dr Panjab Singh. Since April 2017, the present Executive Council of the Society has taken a number of initiatives for the progress and welfare of the Society and many accomplishments have been registered as enumerated ahead.

The Scenario of Indian agriculture is changing, as it is facing second generation problems. Climate change is now reality and is manifesting as increase in mean temperature, changing pattern of monsoon, shortening of winter period, change in pest dynamics, shifting of cropping zones, etc. It is estimated that crop production loss in India by 2100 could be 10-40 per cent. The per capita availability of water will decline to 1140 m<sup>3</sup> by 2050 from 1820 m<sup>3</sup> in 2001. The growth in human population is affecting the land use pattern available for agriculture and forest cover. Over the years, the food habits and consumer preferences are changing. Now consumers buy more “ready-to-eat” or “ready-to-cook” food.

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In view of this, we agronomists should broaden our vision to get along with the national priorities and re-define the role of Agronomy which is closest to the farmers. We should think and work in wider perspective beyond crop production and also focus on post-harvest management, quality, value addition, processing and effective marketing of produce. We should not only emphasize yield realization but give thrust to profit realization for income security of the farmers. It is the need of the hour to shift our focus and priority from sustainable crop production to sustainable farm income. Agronomists have to lead from the front to bring about paradigm transformation in farm production system through appropriate strategies, approaches and interventions.

At the end, I take the opportunity to express sincere thanks to all the Members of Executive Council of ISA for their constructive support and cooperation during the entire period of the present EC. I also extend special thanks to all the Chairman, Conveners and Members of various Committees constituted in last two years to carry forward the Society in right direction with speed.

(A K Vyas)  
President, ISA &  
ADG (HRM), ICAR

### General Body (GB) Meeting

The General Body (GB) Meeting of the Indian Society of Agronomy was held on October 25, 2018 at Rajasthan College of Agriculture, MPUAT, Udaipur.

### I. Dr A K Vyas, President, ISA presented various Initiatives and Accomplishments of Executive Council of ISA during 2017 & 2018 as

- I. **Activation and Autonomy to Local Chapters of ISA:** There were hardly 05 active Chapters up to 2016 but their number has been doubled to 10 now (including new Chapters Ranchi, Indore, Jobner, Hisar, Varanasi). A committee was constituted under the Chairmanship of Dr MS Yadav, Chairman, BAU, Ranchi which suggested ways and means to activate local Chapters along with autonomy. The recommendations were approved by the EC and circulated to all life members. Now a financial support of Rs. 10,000/- per year is given to active Chapters by the ISA HQs.
- ii. **Publication of Indian Society of Agronomy Newsletter:** In order to apprise the Society members about the activities and accomplishments of the Society, ISA started publishing *Indian Society of Agronomy Newsletter* quarterly since July, 2017 under the able guidance of Dr TC Jain, Editor-in-Chief.
- iii. **Introduction of Editorial in Indian Journal of Agronomy:** For the first time, Editorial has been introduced in the IJA since March 2017 issue. The Editor-in-Chief and Co-Editor-in-Chief share their views on various aspects of agronomic research and recent updates. This initiative has been acknowledged and recognized by National and International Societies/Journal especially by American Journal of Agriculture and Forestry.
- iv. **Online Distribution of IJA and Newsletter:** To support Green Initiatives of the Nation and bring down carbon load and cost of publication, soft copies of the IJA and ISA Newsletter are being distributed since September 2017. This has resulted in significant savings to the Society per issue to the tune of Rs. 1.5 lakh including postage.
- v. **Publication of Agronomy Text Books for UG Students:** Based on Agronomy course curriculum approved by the V Deans' Committee for UG level, 09 Text Books are in the process of publication with the help of top 09 SAUs under the Chairmanship of Dr. TC Jain, Editor-in-Chief, IJA. Few will be

published soon.

- vi. **Reviewed Guidelines for ISA Awards:** To improve transparency in the award system of the Society, a Committee was constituted under the Chairmanship of Dr TC Jain, Editor-in-Chief, IJA to comprehensively review the Award system along with no. of Awards. Recommendations of the Committee were circulated widely and adopted for ISA awards 2015 onwards. Number of ISA Best M.Sc. Thesis Award, ISA Best Ph.D. Thesis Award and ISA Associate have been doubled to recognize the contribution of young Agronomists. Award money has also been reasonably enhanced for all the Awards except ISA Life Time Achievement Award. For ISA Life Time Achievement Award, cash award has been replaced with befitting citation, memento and shawl so overall financial liability has not increased. Introduction of ISA-Best Chapter Award has been proposed and placed before the GB for approval.
- vii. **Enhancing Employment Opportunities for Agronomy:** To ensure better employment opportunities for budding agronomists in public and private sectors, a Committee of elders was constituted under the Chairmanship of Dr Ambika Singh, Former President, ISA to find out ways and means to enhance the employment opportunities. An Action Plan, based on the note of Dr Ambika Singh and Dr Kalyan Singh entitled "The Employment Opportunities for Agronomists - Past, Present and Future", has been prepared by Dr TC Jain, Editor-in-Chief, IJA for more Employment Opportunities for Agronomists.
- viii. **Enhancement in the Cadre strength of Agronomists:** Thirty per cent increase in Cadre Strength of Agronomy discipline in ICAR has been requested by the President, ISA to Secretary, DARE & DG, ICAR. Similar request was also made 4 years back by him as Vice President, ISA.
- ix. **Developing Agronomic Success Stories:** To showcase and highlight the contributions of agronomy, success stories which have helped to achieve self-sufficiency in food production and improving the farm income are being finalised under the Chairmanship of Dr Panjab Singh, Former President, ISA and President, NAAS. Eleven Success Stories have been developed and will be finalized by 31<sup>st</sup> January, 2019.
- x. **Improving Transparency in Publication of**

**Research Papers:** In order to improve transparency in publication of research papers in IJA through rational distribution across Institution/Region/Crop, an analysis of the research papers published in the Journal during 2013-2016 was done by the President, ISA. Highlights were communicated to the Editor-in-Chief and Co-Editor-in-Chief for consideration and appropriate action and also published in the ISA Newsletter Vol. 1 (3) for the members.

- xi. Improvement in NAAS Rating of IJA:** As every member of ISA expect higher NAAS rating for the IJA, therefore, present EC decided to take all necessary steps for further improvement in the NAAS rating. The recommendations of the Committee constituted under the Chairmanship of Dr Arvind Kumar, VC, RLBCAU, Jhansi are being followed to attain NAAS rating 6.0 and above at the earliest possible.
- xii. Out - sourcing for publication of IJA:** A Committee was constituted under the Chairmanship of Dr TC Jain, Editor-in-Chief, IJA and Convenership of Dr VK Singh, Vice-President, ISA to analyse the proposal of out-sourcing the publication of Indian Journal of Agronomy. The Committee has identified Springer for such collaboration and this matter will be placed to GB for seeking approval.
- xiii. Effective Revision of List of Life Members of the Society:** State-wise list of Life members is being updated under the Chairmanship of Dr RP Singh, Former Head, Agronomy, IARI with the special efforts of Dr Rajiv Kumar Singh, PS, Agronomy, IARI, New Delhi as Convener. So far the details of about 900 Life members have been updated.
- xiv. Redesigned New ISA Website:** To make the Society Website impressive, user friendly, dynamic and non-tempered, a Committee was constituted under the Chairmanship of Dr V K Singh, Vice President, ISA. The Website has been redesigned to meet the expectations of the ISA members in a very cost effective manner. Payment of the membership/ registration fee could be done online in near future.
- xv. Adopted Redesigned New Cover page of IJA:** To give a fresh and impressive look to the Cover page of IJA, a Committee was constituted under the Convenership of Dr VK Singh, Vice President, ISA to finalize the New Cover page of IJA which has been adopted w.e.f. June, 2018 issue. New cover page has been appreciated in the scientific community.
- xvi. Revision of ISA Constitution:** A Committee was

constituted under the Chairmanship of Dr RP Singh, Secretary General, IAUA & Former Head, Agronomy, IARI for comprehensive revision and updating the Constitution of ISA for effective functioning with greater accountability and transparency. Committee has finalized its recommendations based on valuable suggestions received from the members for placing before the General Body of the ISA for consideration and approval.

- xvii. Filing of the Pending Income Tax Returns (FY 2009-15):** IT Returns of the ISA were pending for the FY 2009-10 to 2015-16. The Society got the IT Notice u/s 148. Experts Tax and Chartered Accountant of ISA advised to file ITR for the pending years to avoid any complications in future. Liability is expected to be Rs. 25.00 Lakh in all. ITR for FY 2009-10 has been filed and cleared by the IT Deptt. after depositing a sum of Rs. 4.17 lakh. ITR for FY 2010-11 has been filed but the demand from IT Deptt. is not received so far.
- xviii. Registration of the Society under Section 80G of IT Act:** Recently, the Society has obtained 80G certificate from the IT Department so that the Society and funding agencies may get due benefits in IT. This is an essential requirement to strengthen the Society as per Govt. norms which was never addressed before.

**Tax benefits to the Donors:**

- A donor can claim 50% Tax Exemption from the donation made to the Society registered with IT Department through 12A under section 80G of the IT Act of 1961.

**Benefits to the Society:**

- Only a Society registered under both 12A and 80G is eligible for availing government funding.
- 80G registration also helps in seeking foreign contributions.
- Income is exempted from tax when certain prescribed conditions are fulfilled under Income Tax Act.

**xix. RNI No. for ISA Newsletter:** Society is about to get the RNI No. for ISA Newsletter.

**xx. Strengthen the Society financially after the Symposium,** may be with more than Rs. 10.00 Lakh savings.

**II. Presentation of Audited Report for the Year 2016-17 and 2017-18 by Treasurer, ISA**

Dr Ashok Kumar, Treasurer, ISA presented the details of income and expenditure before the General Body.

Members asked for Audited Report and details of income and expenditure as per Audited Balance Sheet for the year 2016-17 and 2017-18 which could not be provided by the Treasurer. Members raised very serious matter of withdrawal of pre-mature Fixed Deposit (FD) without the concurrence of EC & GB to the extent of 23.00 Lakh or even more for the organisation of the 4<sup>th</sup> International Agronomy Congress in 2016. Majority of the members took it as very serious issue to be settled appropriately. Finally, members unanimously decided that the withdrawal of pre-mature Fixed Deposit cannot take place without the concurrence of the EC and approval of the EC proceedings. Further, it was decided that the President shall ensure that such things do not repeat in future.

#### Details of Fixed Deposits are as under

- ◆ 2016-17 - Rs 1,63,03,364.63
- ◆ 2017-18 - Rs 1,72,41,095.23

### III. Approval for Publication of IJA by Springer

The House unanimously approved the proposal to go ahead with the publication of Indian Journal of Agronomy by Springer w.e.f January, 2020, as Springer has requested one year time to make all necessary arrangements for publication. It was further decided to protect the interest of ISA members and the Society.

### IV. Amended ISA Constitution for Approval

On the request of the ISA members and the Local Chapter, the EC in its meeting held on 5<sup>th</sup> April, 2018 constituted a Committee under the Chairmanship of Dr R P Singh, Secretary General, IAUA and Former Head,

Audited Report for 2016-17 and 2017-18					
Income			Expenditure		
Head	2016-17	2017-18	Head	2016-17	2017-18
Life membership	572770	462000	Printing and publication of journal and books	3267205	1102990
Annual membership	75245	182833.85	Salary of staff	839800	844560
Library fee	496487	478200	Award	243600	NA
Book sale	243240	332055	Meetings expenditure	61752	60393.87
ICAR grant	150000	150000	T.A., D.A. and Conveyance	146203	94098
Misc	9281.75	NA	Dispatch	212467	116823
International Agronomy Congress			Election expenses	210417.3	NA
Registration fee	7435941	94000	Office expenses (repair, maintenance, festival exp., telephone and mobile charges)	109258.2	79647
Sponsorship	1400000	490000	International Agronomy Congress	10256291	NA
Exhibition receipt	2106250	NA	Bank charges	4639	2713.63
Advertisement receipt	180000	NA	Depreciation on fixers	67037	28470
ICAR grant for IAC	750000	250000	Website and software	169560	117746
DST grant	300000	NA	Income tax	—	417780
Interest on FDs/saving	81605.65	41502.34	Total	15588229.5	2865221.5
Interest accrued	1194918.85	1101305.18			
Total	14995739.25	3581896.37			

Division of Agronomy, IARI to review and update the ISA Constitution. The committee circulated the first amended draft of the ISA constitution in the first week of July, 2018 for the suggestions/comments of the Life Members. ISA Constitution Committee finalized the proposed amendments after incorporating the appropriate suggestions received from the members. The final amended ISA Constitution was put up before the EC on 18<sup>th</sup> September, 2018 and EC decided that the Final amended ISA Constitution be circulated once again to all the Life members for their valuable suggestions/comments latest by 30<sup>th</sup> September, 2018 for the consideration and approval of the General Body to be held on 25<sup>th</sup> October, 2018 at MPUAT, Udaipur.

The suggestion/inputs from 65 ISA members were received till 30<sup>th</sup> September, 2018, out of which only 05 members were not in favour of amending the ISA Constitution. Out of the rest 60 members in favour of

amendments, only 15 members gave few suggestions for improvement of which some of the suggestions were common while 45 members simply appreciated and endorsed the initiatives of EC and the amendments recommended in the ISA Constitution by the Committee for the approval of the GB. Further during the discussion, a spontaneous suggestion was made by the members to have only online mode of election of Office bearers of the Executive Council of ISA as being successfully followed in other professional Societies. The suggestion was welcomed and unanimously approved by the General Body. Thus, the new amended ISA Constitution was approved by the GB as such with thumping majority of more than three-fourth members present in the meeting for implementation with immediate effect. It was decided that the Registrar Society shall be immediately communicated about the amended Constitution. The Zone-wise division of States

was also approved unanimously by the GB for five Vice Presidents as under:

<b>North Zone</b>	J&K, HP, UK, Punjab, Haryana, Delhi
<b>Central Zone</b>	MP, Chhattisgarh, UP
<b>West Zone</b>	Rajasthan, Gujarat, Maharashtra, Goa
<b>East Zone</b>	Bihar, Jharkhand, West Bengal, Odisha, Sikkim, NE States
<b>South Zone</b>	Karnataka, Telangana, AP, TN, Puducherry, Kerala, A & N Islands

#### V. Updating the Directory of Life members with all details before the ISA Election 2019

Though the updating of details of ISA Life members is in progress and so far the details of about 900 Life members have been updated but the House felt to expedite the Updation of the Directory of Life members with all details before the ISA Election 2019. After discussion, it was unanimously decided to hold the election online and upload the complete list of members on the ISA Website and members shall be requested to update their details with authentication latest by 31<sup>st</sup> December, 2018 for online election.

VI. It was decided to have Annual Conference at the Regional level as in case of other professional Societies. The proposal was approved by the GB to organise the Annual Conference in the Zones with the approval of Executive Council of ISA and the funds generated can be utilised by the Local Chapter/Zone for Society activities as per guidelines of new amended ISA Constitution.

VII. In order to promote excellence in the review of the research papers, it was decided to acknowledge the Reviewer at the end of each Issue rather than once in the end of the year. The good performing reviewers may be acknowledged suitably in the ISA Newsletter.

#### **Action Taken/Initiatives on Important Decisions of Executive Council Meeting of 19<sup>th</sup> December, 2018**

- The pending IT Returns for the FY 2010-11 has been successfully submitted with NIL penalty.
- Two text books manuscript have been received and reviewed/edited and is expected to be ready by 31<sup>st</sup> December 2018. It was decided that reviewer's contributions must be recognized while publishing the books. Further, it was decided that publication of planned text books will be done through private publishers after negotiating the royalty and copy right issue of Text Book with the publisher by the

Publication Committee working under the Chairmanship of Dr TC Jain. All the Publications shall be in the name of Indian Society of Agronomy. In addition to the existing Text Book Publication Committee, Dr VK Singh, Vice President, Dr DS Rana, Co-Editor-in-Chief and Dr YS Shivay, Secretary, Indian Society of Agronomy will help in finalizing the modalities of Text Books printing by the Pvt. Publishers.

- It was decided that Dr DS Rana shall consult the Chairman of the Committee Dr Panjab Singh, President; NAAS for further necessary action to finalize few good Success Stories by 31<sup>st</sup> January, 2019.
- Treasurer, ISA informed the estimated expenses for organization of the National symposium at MPUAT, Udaipur are Rs. 38,68,031/- and total received money from various sources including registration fee, ICAR, Sponsorship, Exhibition stalls and Advertisement for the Symposium is Rs. 42,89,900/- . Approx. Rs. 13.37 lakhs is yet to be received by ISA and the expected savings may be Rs.17.58 lakhs.
- As per decision of General Body of ISA, the election is to be organized online for the first time. It was decided to appoint the Returning Officer for conducting the Election and following three names were suggested for Returning Officer as per the order of sequence listed after seeking the consent.
  - i) Dr AK Choubey, Ex-Director, IASRI
  - ii) Dr GC Shrotriya, CEO, Green TV
  - ii) Dr AK Bawa, Executive Secretary, NAAS
- It was decided that there can be only one mode of election as per decision of the General Body, therefore, the Returning Officer should be IT friendly/Expert with transparent credentials and professionally known to set the robust Online election system for free and fair election.
- It was decided that the Committee constituted for Effective Revision of ISA Members working for last one and a half years under the Chairmanship of Dr R P Singh and Convenership of Dr Rajiv Kumar Singh shall Update the details of ISA Members with authentication to finalize Voter list of bonafide ISA members for the ISA Biennial Election - 2019 and 2020 by 15<sup>th</sup> January 2019 before the election process begin.
- EC approved the initiation of the new ISA Chapter at Sriniketan, W.B.
- EC approved the grant of Rs. 25,000/- to Dr YV Singh,

Principal Scientist, NCBGA, Division of Microbiology for the ISA Travel Grant 2017-18 as per the recommendation of the Committee for ISA Travel Grant.

- It was decided to pay only Rs. 25,000/- for organization of the National Symposium on “*Integrated Farming Systems for 3E’s (Ecological sustainability, Enhanced Productivity and economic Prosperity)*” from 23 to 24 December 2018 organized by UAS, Bengaluru provided the UAS Bengaluru Chapter meet out the requirement of the Indian Society of Agronomy.

### New Thought

## SENSOR-GUIDED PRECISION NITROGEN MANAGEMENT

(Anchal Dass, Principal Scientist, Division of Agronomy, ICAR-IARI, New Delhi)

India has become food self-sufficient consequent to ‘Green Revolution’, realized during the late 1960s. India has witnessed a record food grain production (rice, wheat, coarse cereals and pulses) 284.83 million tonnes (mt) for the year 2017-18. However, there are several issues haunting Indian agriculture; most importantly, low farm incomes due to rising input prices, low input-use efficiency, environmental deterioration and climate change, need greater attention of the scientists, policy makers and development agencies concerning agriculture. To improve resource-use efficiency and reduce environmental footprints of agriculture, precision farming offers a potential solution. In India, there have been some developments in precision farming research, though largely under controlled conditions. Now, there can be greater use of available technology to make precision agriculture feasible; Precision planter to seed the crop at proper density and depth, soil and plant sensors for precise nutrient and water management, hyperspectral cameras and remote sensing using drones need to be evaluated on large scales for developing feasible precision input management solutions and practices.

Precision farming is defined as an integrated information and production based farming system that is designed to improve long-term, site-specific and whole farm production efficiency, productivity and profitability while minimizing un-intended impacts on humans, wildlife and the soil and water environments.

It is infact applying the right input, in right amount,

in the right place, in the right manner, and at the right time. In this context, better cognizance and understanding of the potential of precision farming practices in improving productivity, produce quality, farm profit, resource-use efficiency and lower negative impact on environment, research on the precision farming subject is being emphasized, largely with respect to fertilizer and water applications, for last couple of decades. Among plant nutrients, precise supply of nitrogen (N) to crop plants can be achieved by using plant N sensors like Chlorophyll meter, GreenSeeker, Radio-spectrometer and Leaf Colour Chart (LCC) that have been shown to provide quick assessment of plant leaf N status on a real time mode.

It is an established fact that fertilizer management contributes larger than 50% increase in grain yield in cereal crops. Particularly, the use of N-fertilisers had been instrumental in enhancing agricultural production world-over including India. Doubling of world’s agricultural food production over the past four decades has been associated with a seven-fold increase in the use of N-fertilisers. Yet, over the years, wide spread N-deficiency in soil has become a serious concern because 50% of the human population rely on N-fertiliser for food production. This has led to greater use of N-fertilisers, even higher than the recommended in certain pockets of the country.

Of late, there has been a serious concern about environmental footprints of N-fertilisers, particularly in green-house gas emission from the agricultural fields. To meet the growing need for N-fertilisers due to the increase in food requirement of ever multiplying population and on the other hand also to mitigate increasing environmental and atmospheric pollution, improving nitrogen-use efficiency (NUE) appears to be a viable solution. This can be done through synchronization of N-supply with the plant demand. For that, ascertaining plant N-status quickly is a pre-requisite. Conventional approaches of soil and plant analysis are costly, time consuming and require high level of skill and expertise, and often, N-deficiency cause the damages before N hunger is determined. Here, plant sensors capable of indirectly estimating plant N-status are of great help. Leaf colour-chart (LCC), chlorophyll meter, crop circle, Green Seeker, Spectro-radiometer and Hyper-spectral cameras are capable of determining plant N-status. The LCC, Chlorophyll meter and GreenSeeker can be used for precise N-scheduling in crops like, wheat, maize and rice. Scheduling N using such sensors have been shown to save 25–50% N without yield penalties.

The following are some of the suggestions for promoting the use of plant sensors in managing N:

- Development of cheap and efficient sensors locally
- Exhaustive evaluation of sensors across the crops, locations and the environments
- Development of simple algorithms for determining time and amount of N to be applied
- Capacity building of stakeholders for correct and efficient use and maintenance of sensors
- Development and standardization of threshold sensor indices for precise N supply
- Integration of sensor indices with existing decision support tools, crop growth models
- Development of mobile phone-based applications for efficient use of such sensors
- Policy interventions for promoting use of plant sensors.

### Research Highlights Agro-technologies Developed

#### Drip-irrigated rice for higher water productivity under changing climate scenario

(Ashaq Hussain, G A, Parray, Manzoor, A Ganai, I A Jehangir, Najeeb S; Mountain Research Centre for Field Crops (SKUAST-K), Anantnag)

A demonstration plot on drip irrigated rice was established for the first time at Mountain Research Centre for Field Crops, Sher-e-Kashmir University of Agricultural Sciences and Technology, Anantnagar during the *Kharif* season, 2018. The herbicide application resulted in good control of weeds upto 40 DAT. However, at later stages of the crop some weeds commonly found in upland conditions, such as *Cynodon dactylon*, *Portulca oleracea*, *Cyperus iria* L., *Cyperus difformis* L. were observed. A grain yield of 5.92 t/ha and straw yield of 6.84 t/ha were observed. The most significant achievements of the drip irrigated rice demonstration was that it led to an increase of water productivity by 50% and water saving by 45.35% over flood irrigated rice (6.5 t/ha grain yield).



#### Weed management in conservation agriculture based pearl millet-mustard-green gram cropping system

(Kapila Shekhawat, SS Rathore, TK Das, Rishi Raj and

Raj Singh; Division of Agronomy, ICAR-IARI, New Delhi)

In conservation agriculture based pearl millet-mustard-green gram system, brown manuring of *Sesbania* (knocked down by 2,4-D@ 0.5 kg/ha at 25 DAS) in pearl millet, followed by fenoxaprop-p-ethyl (0.05 kg/ha)+oxyflurofen (0.075 kg/ha) as post-emergence tank-mix application at 30 DAS in mustard resulted in the highest system productivity. It also resulted in 56.9 and 47.8% reduction in weed density in pearl millet at 30 and 45 DAS, respectively over control. The reduction in weed density in mustard was 44.7 and 56.9% at 30 and 45 DAS, respectively over weedy check.

#### Effect of environmental conditions and vermicompost on essential oil content and composition of *V. jatamansi*

(Rakesh Kumar CSIR-Institute of Himalayan Bioresource Technology, Palampur)

Elevated CO<sub>2</sub> enhanced the essential oil content by 17.7% and elevated temperature decreased it by 4.3% as compared to ambient conditions. Patchouli alcohol, bornyl acetate, β-patchoulene, germacrene D monoterpene hydrocarbons and oxygenated sesquiterpenes were significantly higher in FACE and FATI as compared to ambient. Vermicompost application increased *trans*-β-guaiene, globulol, β-patchoulene, camphene, germacrene D and bornyl acetate content. These results indicate that elevated CO<sub>2</sub> and temperature alters essential oil content and composition of *V. jatamansi*.

#### Integrated crop management practices for pigeonpea

(Anil K. Choudhary, Varatharajan T, Anchal Dass, Vijay Pooniya; Division of Agronomy, ICAR-IARI, New Delhi)

A study was conducted during *Kharif* 2015–2017 in pigeonpea to develop efficient integrated crop management (ICM) modules at ICAR-IARI, New Delhi. Among nine different ICM modules devised and tested, the conservation agriculture (CA) based ICM module comprising zero-tilled + permanent raised-beds (width-70 cm) + crop residue retention @ 3 t ha<sup>-1</sup> + 100% RDF +



glyphosate-PP fb pendimethalin-PE fb imazethapyr-POE + 1 hand-weeding fb mulch + 2 irrigation (60 mm each) + need based IDM/IPM] was most productive (seed yield 1.92 t ha<sup>-1</sup>; net returns: INR 82,776 ha<sup>-1</sup>) and water efficient (total water-use efficiency 2.96 kg ha<sup>-1</sup> mm<sup>-1</sup>; water productivity 104.5 INR ha-mm<sup>-1</sup>) during 3<sup>rd</sup> crop season.

**Using single-row SWI-planter enhances wheat productivity (Anchal Dass, HL Kushwaha, TK Khura, PK Sahoo, Shiva Dhar, Mukesh K Singh and Indra Mani; ICAR- IARI, New Delhi-12)**

System of Wheat Intensification (SWI) out-performs conventional wheat cultivation. But in this method, planting of 2-seed in each hill at 20 × 20 cm spacing is a tedious, time consuming and expensive job. Thus, the Division of Agricultural Engineering with the involvement of Scientist of Agronomy Division, ICAR-IARI, New Delhi, developed a Single-Row Manual SWI planter to make the SWI-planting easy and economical. The planter was tested on HD2967 wheat. Germination of seed, plant growth and grain yield were significantly better in machine sown plots compared to conventional or manually sown SWI/ non-SWI plots. Final yield in machine-sown SWI was more than conventional planting of wheat by > 25%. Thus, the Single-Row SWI-Planter can be used for making wheat sowing using SWI methods feasible and economical.



**Single-Row SWI-Planter**



**Single-Row Manual SWI-Planter sown wheat**

**Improving crop productivity and resource-use efficiency of different rabi crops under conservation agriculture practices in rainfed condition of India (Raj Singh and VK Singh; ICAR-IARI, New Delhi-12)**

In chickpea, the soil temperature recorded at 10 AM and 3 PM decreased by 0.75 to 1.5°C at 0-15 cm soil depth due to ZT+ residue mulch during the pod formation to maturity period over CT. ZT+ residue mulch resulted in 7.5 and 11.7% increase in yield over ZT+ standing residue retention and CT, respectively. Application of 4 t/ha residue recorded 8.3% higher yield over 2 t/ha. Growing chickpea during rabi season after pearl millet recorded 41.9% and 21.5% higher yield than lentil and barley, respectively. The highest net returns (INR. 34,590/ha) and B:C ratio (1.27) were obtained in ZT+ residue mulch against INR. 26,064/ha net returns and 0.92 B : C ratio in CT. Overall, the application of 4 t/ha residue and pearl millet-chickpea cropping systems were found to be the best CA components.



**Honours/Awards/Recognitions**

Dr D Subramanyam, Professor, Department of Agronomy, Sri Venkateswara Agricultural College, Tirupati Campus of Acharya N.G. Ranga Agricultural University, A.P. has been conferred with “ Fellow of



**Indian Society of Weed Science- 2017”** during ISWS Golden Jubilee International Conference held from 21-24 November, 2018 at ICAR-Directorate of Weed Science, Jabalpur, MP.

Dr. V Praveen Rao, Hon’ble VC, PJTSAU received “**Life time Achievement Award**” from the Hon’ble Vice President, Shri M Venkaiah Naidu on the eve of Annual Awards function of “Rythu Nestham and Muppavarapu Foundation” on 07<sup>th</sup> October, 2018 at Swarna Bharath Trust, Muchinthal, A.P.



Dr Rao also received “**Education Leadership Award**” from 26<sup>th</sup> Business School Affair and Devang Mehata National Educational Institute on 16<sup>th</sup> November, 2018 at Taj Banjara, Hyderabad. He received this award for making PJTSAU as a one stop destination for agricultural innovation encompassing Education, Research and Extension.



Dr Anchal Dass, Principal Scientist (Agronomy), ICAR-IARI, New Delhi has been conferred with “**Fellow of GKV Society**



**Award-2018**” and “**Best Poster Award**” during National Conference on “**Managing Natural Resources for Sustainable Agriculture**” during 8–9 December 2018 at RBS College, Agra, U.P.

Dr Anil K Choudhary, Senior Scientist (Agronomy), ICAR-IARI, New Delhi has been conferred with “**Best Extension Scientist Award-2018**” by SADHNA Society, YSP University of Horticulture and Forestry, Solan (HP) for the year 2018.



### Conference/Seminar/Workshop/ Event Organised

**XXI Biennial National Symposium of Indian Society of Agronomy was held at MPUAT, Udaipur, Rajasthan from 24-26 October, 2018.**

The Indian Society of Agronomy organised XXI Biennial National Symposium on “*Doubling Farmers' Income through Agronomic Interventions under Changing Scenario*” from 24-26 October, 2018 at Udaipur, in collaboration with the Indian Council of Agricultural Research, New Delhi and Maharana Pratap University of Agriculture and Technology, Udaipur, Rajasthan. The National Symposium provided platform for interaction among the scientists, administrators, industrialists, policy makers, research scholars and farmers to deliberate the issues such as reduction in cost of cultivation, improvement in productivity, increase in cropping intensity, agricultural diversification including high value crops and improved price realisation by farmers, which have relevance to increasing the farmer’s income. These issues were discussed in depth to develop concrete



recommendations for solving the emerging challenges of Indian Agriculture and thus to contribute in achieving the National goal to double farmers’ income by 2022.

The symposium was inaugurated by Prof. Ramesh Chand, Hon’able Member NITI Aayog, Govt. of India in the presence of Prof. U.S. Sharma, Vice Chancellor, MPUAT, Udaipur as Chairperson and Dr N.S. Rathore, DDG (Education), ICAR, New Delhi as Guest of Honour. Dr S.L. Mehta, Former VC, MPUAT, Udaipur and Dr A.K. Singh, DDG (AE) ICAR and Acting Director, IARI, New Delhi graced the occasion during the Valedictory function. About 400 delegates from different parts of the country and a few from abroad made their presentation on the theme of the symposium as keynote speakers, lead speakers, rapid fire speakers and through poster presentation. Feedback from the progressive farmers drawn from the four states served as a source of researchable issues to the delegates. At Inaugural Function on 24<sup>th</sup> October, 2018, Society honoured Dr Kalyan Singh Former Dean, BHU, Varanasi and Dr B. Gangwar, Former Director, ICAR-IIFSR, Modipuram, Uttar Pradesh, with Life Time *Achievement Award*. Beside this, the Society honoured 08 renowned agronomists with ISA Gold Medals and 16 with ISA-Fellows. In addition to this, 05 Agronomists received ISA Associateship, 02 Dr P.S. Deshmukh Young Agronomist Award, 04 Best Ph.D. Thesis Award, 04 Best M.Sc. Thesis Award and 02 ISA Best Paper Award. Various publications brought out by the Society on this occasion were released for the benefit of delegates, students, teachers, development personnel and policy makers.

Other important presentations in the symposium included Presidential Address by Dr A.K. Vyas, President Indian Society of Agronomy, Dr P.S. Lamba Memorial Lecture by Prof. Ramesh Chand, Member NITI Aayog, Govt. of India on “*India’s Agricultural Challenges: Opportunities and Development Policies*”,

special lecture by Dr T.C. Jain, Ex-Senior Agriculturist, World Bank on “*Outlining the Role of Agronomists in Doubling Farmers’ Income in Changing Scenario*” and evening lecture by Prof. Janat Shah, Director, IIM, Udaipur, Rajasthan on “*Management Perspective of Doubling Farmers Income*” on 24<sup>th</sup> October, 2018. The Symposium had 9 concurrent technical sessions covering sub-themes of the symposium viz. Efficient Management of Low-or no-cost Inputs and Bio-resource Utilization; Efficient Rain and Irrigation Water Management; Diversification for Sustainable Resource Use and Farm Income; IFS and ICM for Different Agro-ecosystems; Conservation Agriculture and Climate Resilient Agronomy; Organic, Precision and Contractual Farming; Farm Mechanization, Post-harvest Management, Processing, Value Addition and Marketing; Agronomy Education, Training, Technology and Enabling Policies to Support Income Generating Activities and Rapid Fire Presentations. Beside this, a General Session before the Valedictory Function focused on topical issues of agronomists’ viz. Job Opportunities for Agronomists, Enhancing Interpersonal and Communication Skills and Psycho-social Issues in Farmer’s Entrepreneurship.



All these issues related to doubling farmer’s income were deliberated in details over 3 days presentations of the Symposium and practical and viable



recommendations were evolved, which will be shared with the delegates, policymakers, administrators, researchers, teachers, students and other stakeholders for implementation soon.

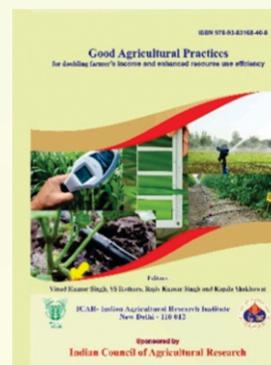
The organisation of the National Symposium was a grand success and every delegate and Guest appreciated the memorable hospitality of MPUAT, Udaipur.

Winter school on “**GAPs for doubling farmer’s income and enhanced resource use efficiency**” (December 11-31, 2018) was held at the Division of Agronomy, ICAR-IARI, New Delhi. (Course Director: Dr V K Singh; Course coordinators: Dr S S Rathore, Dr Rajiv K. Singh and Dr Kapila Shekhawat; Participants: 24).



### New Publication

Singh, VK, Rathore, SS, Singh RK and Shekhawat K. 2018. Technical manual on “*Good Agricultural Practices for doubling farmer’s income and enhanced resource efficiency*”. Division of Agronomy, ICAR-IARI, New Delhi. 123p.





## Foreign Visit/Fellowship

Dr Rakesh Kumar, Principal Scientist, CSIR-IHBT Palampur, HP attended Taiwan-India Symposium on Traditional Medicine" which was organized by Dept. of Chinese Medicine and Pharmacy, Ministry of Health and Welfare, Taiwan, on Oct. 5-6, 2018 at Taipei City, Taiwan and delivered invited talk on the topic entitled "The management and development of traditional medicine in India".

Dr Rajendra Lakpale joined as Dean, College of Agriculture and Research Station, IGKV, Bhatapara (Chhattisgarh) on 29.9.2018.



Dr TK Das, Principal Scientist joined as Professor, Division of Agronomy, ICAR-Indian Agricultural Research Institute, New Delhi on 17.11.2018 for a period of five years.



## Appointments/Promotions/Superannuations

Dr. Jayanta Deka, Principal Scientist & PI, AICRP on Weed Management and Head, Science & Technology Cell, Office of the Vice Chancellor, Assam Agricultural University, Jorhat has been appointed as Dean, Faculty of Agriculture of the University w.e.f. 1<sup>st</sup> September, 2018.



He is also looking after the activities of ICAR Education Division in the University as Nodal Officer.

### Editorial Board

**Editor-in-Chief** : Dr TC Jain  
**Co-Editor-in-Chief** : Dr DS Rana  
**Executive Editor** : Dr Anchal Dass

**Editors** : Drs NK Jain, Anil K Choudhary, Rajender Kumar, Rajiv K Singh, Kapila Shekhawat and MD Vyas

**Dear Esteemed Members,**

We look forward to your valuable contributions and suggestions for improvement of the Indian Society of Agronomy Newsletter at [isanews2017@gmail.com](mailto:isanews2017@gmail.com)

Editorial Board

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