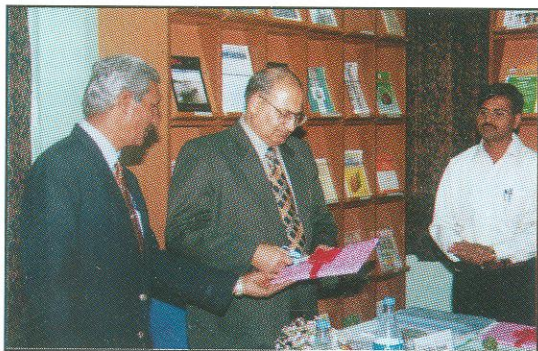


HON'BLE DG DR. R.S. PARODA VISITS THE CENTRE



For the first time, Dr. R.S. Paroda, DG, ICAR visited the National Research Centre for Onion & Garlic on 4th Jan, 2000. Dr. K.E. Lawande, Director, NRCOG, welcomed the Hon'ble dignitary on behalf of the centre and staff members. The hon'ble DG was apprised about the ongoing activities at the centre *vis. a vis.* research and administrative. The Director General also visited different laboratories in the centre *viz.*, Horticulture, Plant Tissue Culture, Pathology, Entomology, Soil Science and Computer Facilities created at the centre under ARIS Cell.

While addressing the staff, the Director General stressed the importance of genetic resource management, cropping system studies and organic manuring in both the crops in the present scenario. He praised the Director and Scientists for their "enthusiastic efforts and good research programme". In his own word "The facilities being build and proposed to be created would make this one of the finest NRC's in the ICAR system". He also emphasized the need for training scientists in the advanced technologies and application of computers in research activities.

On this occasion, the hon'ble dignitary released two technical bulletins *viz.*, 'Kanda Lagwad' and 'Kandyavaril rog ani kidinche vyavsthan' prepared by this centre for extension purpose. He appreciated the Director for 'providing good research leadership' in overall development of the centre. The centre honoured the chief guest by presenting a shawl and a memento as a token of love and respect.

DR. DEBENDRA PRADHAN, MOS VISITS NRC FOR ONION AND GARLIC

Dr. Debendra Pradhan, Hon'ble minister of State for Agriculture, Dairy and Animal Husbandry visited National Research Centre for Onion & Garlic on 13th June, 2000 to acquaint himself with the ongoing research projects in various fields like crop production, crop improvement and crop protection. He was accompanied by the Director of Horticulture, Dr J.P.Mahalay and Director, NRC for grapes, Dr S.D.Shikhamany. Dr K.E.Lawande, Director, NRC O&G welcomed all the dignitaries and gave a presentation on the major issues faced in onion & garlic, the storage problems along with the strategies to be adopted to overcome these challenges and highlighted the major achievements of the centre.



NATIONAL RESEARCH CENTRE FOR ONION AND GARLIC

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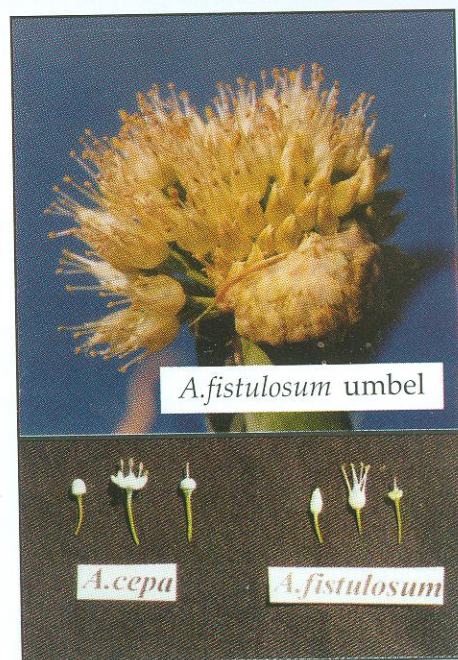
During the function organized by the centre, two of the centre's publications viz., I and II issues of Onion-Garlic Newsletter (Vol. II) were released by the Hon'ble minister. The minister in his speech called upon the scientists to work towards the overall research and development activities with regards to the two most indispensable vegetables in the Indian cuisine. He praised the Director and scientists for their enthusiastic efforts in establishing the infrastructure and formulating relevant research strategies to combat the present and future problems. Dr. K. E. Lawande, Director, hailed the visit of the Minister of State, Dr. Debendra Pradhan and presented him with a memento on behalf of all the staff members.

RESEARCH HIGHLIGHTS

A. CROP IMPROVEMENT

GERMPLASM EVALUATION :

- In *rabi* season, a preliminary evaluation trial of 61 indigenous onion (*Allium cepa* L.) lines was undertaken for yield and other desirable horticultural traits. Yield per square metre ranged from 4.76 – 2.25 Kg and acc. no. 206 performed best (4.76 Kg.). On the basis of average bulb weight, acc no. 206 was adjudged best (73.76 gm.) followed by acc no's 174, 132, 25-OP-2, 15 R, 201, 133, 149, 14-2 R and 51. These lines will be further evaluated in replicated trials to select the elite lines for further breeding programmes.
- A total of 83 garlic (*Allium sativum* L.) accessions were evaluated in *rabi*, 1999 for various yield contributing characters. Out of the total three accessions, acc. no. 72 recorded highest yield / sq. m² (4.37 Kg) and acc. no. 221 recorded highest average bulb weight (23 gm). Acc. no. 71 had the maximum number of cloves / bulb (32) and the range was 32-22.1 for the best ten promising lines. These accessions will undergo further advanced trials along with suitable checks for identifying promising lines.
- Six lines of *Allium fistulosum* viz., TA 104, TA 106, TA 108, TA 198, TA 204 & AF 468 obtained from AVRDC, Taiwan were evaluated for their germination ability and crossability with local commercial cultivar. TA 106 gave good germination followed by AF 468, TA 104 and 204 whereas TA 108 and 198 did not germinate at all. Crossing of lines TA 106 and 104 with the commercial variety N-2-4-1 was initiated in February, 2000 along with reciprocal crosses because of their good flowering percentage. In the crosses where N-2-4-1 was used as female the success rate was 29% with TA 106 and 28% with TA 104 whereas in the reciprocal crosses the seed set was 12% with TA 106 and 4% with TA 104.



VARIETAL EVALUATION :

- Among four released varieties, Basawant 780 recorded significantly highest yield (112.00 q/ha) of marketable bulbs consecutively for second year. The percentage of A and B grade bulbs was higher
- Five released varieties are being evaluated for their performance in late *kharif* (*Rangda*) since last year by sowing seed at every fortnight starting from 1st August to 15th September. Irrespective of varieties, seed sowing in first week of September and subsequent transplanting in October recorded highest yield of marketable bulbs (254.00 q/ha). Among the varieties tested Basawant 780 recorded highest yield ranging from 227.3 to 307.2 q/ha during different dates of planting.
- During *rabi* season, N 2-4-1 (265.3 q/ha) followed by Basawant 780 (265.0 q/ha) recorded highest yield of marketable bulbs.

EXOTIC HYBRIDS :

- During *kharif* season Mercedes recorded highest yield of marketable bulbs (374.2 q/ha) followed by Rio-Raji-Red (189.5 q/ha).
- Out of 16 hybrids evaluated in *rabi* season, Mercedes (401.9 q/ha), Rio Raji Red (338.1 q/ha), DPS 1043 (478.3 q/ha), DPS 1009 (458.4 q/ha) and DPS 1029 (485.3 q/ha) recorded significantly higher yield of marketable bulbs.



BIOTECHNOLOGICAL APPROACH :

- Preliminary studies on *in vitro* regeneration in onion (*Allium cepa* L.) was conducted using different explants *viz.*, leaf, pseudo shoot tip, roots, flower buds and hypocotyl for studying direct and indirect organogenesis using MS media. 5 mg/l Kin was the most successful in induction of callus from flower buds. 10 mg/l BA was most suitable for regeneration of shoots (8-10). 6 mg/l Kin induced multiple shoots (7-8) from *in vitro* seedling explant obtained directly from flower buds, which were transferred to 0.5mg/l IBA for rooting. Hardening of plantlets is in progress.

B. CROP PRODUCTION

- Granulated ammonium sulphate was tested as a slow release nitrogen fertilizer on the yield of onion bulb in the *rabi* season along with urea as check. The results were promising. However, further studies on the uptake of nitrogen are to be worked out.
- Preliminary studies to evaluate the effect of K, S and different micronutrient salts on the growth parameters of onion and garlic was initiated in pot experiment. The data on the dry matter production was found to be promising and the same treatments will be further extended to field trial studies.

C. CROP PROTECTION

- A trial on seasonal incidence of diseases was conducted by transplanting onion seedlings every fortnight from June 1999 to January 2000. In the seedlings transplanted between 1.11.1999 to 1.1.2000, incidence of *Stemphylium* leaf blight was a major concern and the intensity ranged from 14 to 57%.
- Screening of 205 accessions of garlic germplasm for *Stemphylium* leaf blight revealed that acc. no. 30, 32, 43, 53, 59, 61, 66, 68, 69, 112, 124, 175 and 183 were moderately resistant (intensity = 11-20%). In onion, out of 176 lines screened for SLB, acc.no. 209, 224, 430, 449 were found to be moderately resistant. In *Allium fistulosum*, SLB incidence was 100% for all the four accessions screened. The percentage of infected leaves ranged from 34 to 68% and disease intensity ranged from 45 to 74 percent.
- Economics in management of thrips infesting onion was worked out during *rabi*, 1999 and it was seen that minimum thrips population that could be maintained is 15. Based on the current market price, C:B ratio was maximum at a 30 thrips/plant level. Based on regression coefficient of 129.9 kg/ha, the economic injury level was 41 thrips/plant. Hence, chemical intervention should be made when pest population reaches 30 thrips/plant.
- Effect of different botanical pesticides/extracts was tested for their efficacy against onion thrips, *Thrips tabaci* during *rabi* 1999. All the treatments (Nivaar 4 & 6 ml/l, NeemAzal 2 & 4 ml/l, Annona 5 & 10 ml/l, Karanj oil 1% and Karanj extract 5% and Dimethoate 0.03%) were found significantly superior over control. However, the insecticidal spray of Dimethoate was found significantly superior over botanicals in reducing the pest population. The plots that received Dimethoate and *Annona* @5 ml/l realized higher yields and were at par.
- Effect of date of planting on incidence of thrips and the abiotic factors affecting thrips population were studied during *rabi*, 1999. The onions planted on 15th November were severely attacked by thrips followed by 1st Dec. planting. The planting done on 01.08.99 – 15.09.99 recorded lowest thrips population. However, highest marketable yield was obtained in 15.10.99 planting (461.94 Q/ha.) besides having pest load of 18.63 thrips/plant. It was concluded that regular spraying of insecticides not only reduces the thrips population but also increases the yield, more particularly during 01.06.99 to 15.07.99.
- Different abiotic factors played an important role in population dynamics of thrips. Maximum day temperature was positively correlated with the increase in thrips population build up. Other weather parameters viz., min. temperature, %RH and rainfall have a negative affect on thrips population.

EXPLORATION TRIPS

- An exploration trip to Gujarat was conducted during April 8 – 13, 2000 for collection of indigenous onion and garlic germplasm. The germplasm was collected from farmer's fields and markets in Rajkot, Shishang, Kalavad, Nikavah, Gondal, Jetpur, Dhorajee, Visavadar, Mahuva, Bhavnagar and adjoining villages. Overall, 23 samples in onion (bulb and seed form) and 31 samples in garlic and released two varieties (GG-2 & GG-3) from Gujarat Agricultural University were collected.



- A germplasm collection trip to Orissa was undertaken in May 22-30, for collecting the variability in local onion and garlic crop. The places visited were Aigina, Damnia, Rajdhani, Cuttack, Angule and Sambhalpur. In onion, 10 accessions ranging in colour from dark red, light red, white to rose colour were obtained. In garlic, a total of 22 accessions were collected which ranged in colour from pure white, pale yellow, pink tinged, pink stripped, fully pink, to light rose colour. An accession having only one clove per bulb, popularly known as "Gota" was also collected.

INFRASTRUCTURE DEVELOPMENT

The soil science laboratory has procured an Atomic Absorption Spectrometer (Varian, Australia) for carrying out analysis of soil and plant tissue samples for different micro-nutrients and an Automatic weather station (Skye Instruments, UK) has been installed at the Agro meteorological observatory for recording various parameters viz., minimum and maximum temperature, relative humidity, total rainfall and evaporation rate.

Facilities for drip and sprinkler irrigation have been created for conducting experiments on efficient irrigation management.



OTHER ACTIVITIES

Staff Research Council



The SRC meeting was convened on 08.03.2000 and Dr K.E.Lawande, Director presided over the meeting. Dr S.H.Shinde, HOD Agronomy, Dr U.N.Mote, Prof. (Aril. Ento.), Dr N.D.Jambhale, Prof (Agril. Botany) and Prof. S.A.Memane, Pl. Pathologist of MPKV, Rahuri attended the meeting. The scientists presented their research projects, which were finalized for presentation in the RAC meeting.

2nd RAC meeting

The meeting was held on 20.04.2000 under the chairmanship of Dr. M.L.Pandita (Advisor, FVP, NDDDB). Dr B.S.Dhankar, ADG (VC), Dr P.N.Kale, Dr B.N.Shinde, Dr U.B.Pandey, Director, NHRDF, Mr C.B.Holkar, Chairman, VFComs attended the meeting with Dr (Ms) M.N.Maholay, as Member Secretary. Research projects (RPF-1) were finalized in the meeting.



OUR NEW COLLEAGUE

Mr. M. K. Chandraprakash, Scientist (Computer Applications) joined our centre on 7. 4. 2000. He has completed his post graduation in Computer Applications from Madras University and has served in DRDO for seven and a half years.

He has assumed charge of ARIS cell and is presently involved in development of web page for our centre.

HUMAN RESOURCE DEVELOPMENT

Participation in Seminars/Symposia/Meeting:

Dr. K.E.Lawande, International Symposium on Tropical Root and Tuber Crops (INSTUC III) organized by CTCRI, Thiruvananthapuram, Kerala. 19 – 22, January, 2000.

Dr. K.E.Lawande, International Conference on Micro and Sprinkler Irrigation Systems at Jalgaon, Maharashtra. 8 – 10, February, 2000.



Dr. K.E.Lawande attended seminar on Onion and Tomatoes as Chairman of the session on Onion and Tomatoes, and delivered lecture on "Onion Seed Production" at Krishi Parishad in Krishimela – 2000 at Pimpalgaon on 26 February, 2000.

Publications/Papers

Kirtane, S., Laware, S.L., Khar, A., Lawande, K. E. and Dhumal, K.N. 2000. Effect of chemical mutagen on bulb morphology and yield in onion (*Allium cepa* L.). *Proceedings of the 87th Session of the Indian Science Congress 2000*. Jan 4 -7.

Lawande, KE, V.Sankar, Khar A and A.A.Qureshi. 2000. Garlic. *Kisan World*. 24(5): 63-64

Lawande, K. E. published a paper in Adarsha Sheti Udyog, Tane Aani Tan Vyavasthapan Visheshark (I), entitled, "Kanda va lasun pirkatil ekatmuk tan vyavasthapan", during **May – June – July, 2000**.

DISTINGUISHED GUESTS

Dr. R. S. Paroda	DG, ICAR & Secretary, DARE, New Delhi	04.01.2000
Sh. Sambhajirao Kakde	Ex – MP, Pune Dist.	04.04.2000
Dr. A. G. Sawant	Chairman, ASRB, New Delhi	24.04.2000
Dr. Debendra Pradhan	Minister of State for Agriculture, GOI, New Delhi	13.06.2000

FROM THE DIRECTOR'S DESK

Comprehending the shortage of onion as witnessed during the last two years, Indian farmers continued to swim with the tide and went for increased planting of onion during *rangda* (late *kharif*) and *rabi*, 99-2000. Despite near drought condition in Gujarat, overall production in the country was higher than the normal production years. There was indication of good crop in India right from February, 2000. Reports of increased onion production from other parts of world is also being confirmed. "There is just too many onions being grown throughout the country" acknowledges, Flemming, a USA farmer (Onion World, July-August, 2000). Though increased production led to lowered prices @ Rs. 250 – Rs. 300 per quintal, thereby, benefiting consumers but the ultimate losers were onion farmers. The Maharashtra Govt. tried to alleviate this situation by market intervention policy. Although the objective was good, trading without infrastructures for grading, packing and storage is a big risk. Huge heaps of onion lying in scorching heat for want of storage structures and pre-monsoon rains further compounded the problem. As a result of which, the Maharashtra Government had to suffer losses. Ban on export of onion also added to the woes of Indian farmers.

Meticulous crop planning, firm export policy, development of low cost and affordable on-farm and community storage structure, value added products and new varieties with better storage potential can only augur profit for the onion farmers. In fact, a national policy on onion in future will only help Indian farmers to become globally competitive.

Seed production throughout the country was good, leading to apprehension of lesser market prices and glut in market. The inherent property of viability loss in onion seed after 10 –12 months makes it imperative to develop long term storage facilities at strategic production areas all over the country.

In garlic, major production areas viz., Junagadh, Jamnagar and Rajkot dist. of Gujarat were worst hit by scanty rainfall. Thankfully, the situation of higher garlic prices were obviated by good crop in MP, Rajasthan, Orissa and Maharashtra. Non availability of sufficient seed quantity of released varieties, augmented with higher cost of seed is a big constraint to make garlic production a lucrative venture.

During the period under report, the centre was honoured by the visits of Hon'ble Director General, Dr. R.S. Paroda, Dr. Debendra Pradhan, MOS for Agriculture to review the progress and future plans of our centre. Reponding to the ground reality of farmers situation, the scientists have laid out trials in onion and garlic. On the infrastructure front, major laboratories have been established and a master plan for new administrative building cum laboratory has been finalized.

In order to conserve the biodiversity in onion and garlic, an explored trip to Gujarat and Orissa was carried out in March-April, 2000.

To,