

## From Director's Desk

The period under report experienced an increase in area under *rabi* onion. The high prices of onion throughout the year and problems with sugar industry created favourable situation for non traditional onion growers to plant more area along with regular onion growers. The onion production this year is estimated to the tune of 74 lakh ton as against 66 lakh ton in 2006-07 with 12% increase. Nearly 25 lakh ton has gone in storage. Change of varieties, adoption of better production and storage techniques and creation of storage facilities has helped in increasing productivity of onion. By meeting domestic requirement, the country has exported 11 lakh ton of fresh onion and maintained number one position as exporter in the world. Major export is to Middle East and South East Asian countries and there is rich potential in European Union. We should not be self complacent with the achievements as we have to retain number one position; we must concentrate on quality production with minimum possible production cost to become globally competitive. This would be possible by joining hands by R&D organisations, farmers clubs, APEDA, marketing boards and private exporters. NRC for Onion and Garlic has planned the programme accordingly and is moving towards the goals.

Garlic though a small component, plays very vital role in the economy. The production and productivity is not increasing as per expected rate, however, we could stop the import from China since last two years. Indian garlic is valued for high pungency, pyruvic acid and other pharmaceutical components than exotic long-day varieties. The preference is more in domestic as well as export market. We need to produce more than 6 lakh ton every year with same area by enhancing productivity. Maintenance of prices >25 Rs/Kg provide incentive to the farmers for adopting garlic production. Further, augmenting productivity through improved agro techniques will add to more income to the farmers. Use of micro-irrigation, planting on broad based furrows and integrated nutrient and diseases & pest management techniques recommended by NRCOG is helping garlic growers.

## Research

### Shoot multiplication from mature basal plate explants in Onion



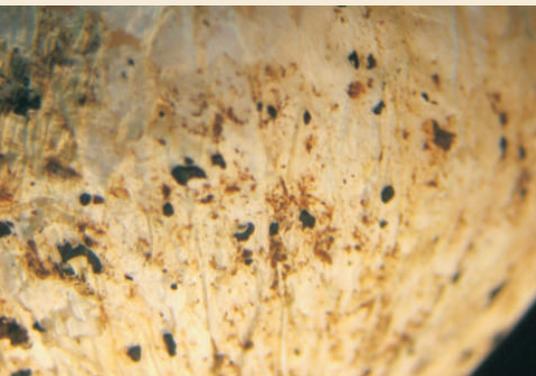
↑ Shoot multiplication

In onion var. N-2-4-1, shoot multiplication was obtained from mature basal plate explant. Earlier protocol was standardized using axenic seedling basal plate, as seeds are easily available and more amenable to culture conditions. However, in cases where the bulbs of important lines had to be multiplied, where seed production is problematic due to various factors like inbreeding depression, diseases, physiological factors, etc., a method for multiplication using basal plate of mature bulbs is needed. The sterilization of basal plates was done using sodium hypochlorite (2% available chlorine) and cultured in MS medium fortified with different concentrations of BA. Preliminary experiments showed initiation of shoot multiplication from BA (1-2 mg/l).

## Callus initiation from leaf

Leaf, as explant for callus induction and regeneration is a commonly used technique in plant tissue culture. However, report of callus induction from leaf explant is reported in only one or two cases in onion. Preliminary experiments on RGO-3 showed callus induction from seedling leaf explant in combinations of BA + 2,4-D having 5% sucrose.

## Black Scurf recorded in onion



↑ Sclerotia on onion bulb

Black scurf caused by *Rhizoctonia solani* (P.S.: *Thanatophorus cucumiris*) is a common disease in potato, where presence of sclerotia



↑ Hyphal branching at right angles

on tubers reduces the market value of the produce. Similar symptoms were observed on bulbs of white onion at NRCOG farm during *kharif*. At the first look it appeared like soil particles adhered to the outer skin of the bulb. On keen observation only sclerotia could be identified. When these bodies/structures were removed from bulb, surface sterilized and plated on PDA, mycelial growth was produced. Colonies were white, circular and effusive consisting of mycelium only. Microscopic examination revealed the branching of mycelium at right angle, which is the characteristic feature of *Rhizoctonia* species. *Rhizoctonia* spp. and *R. solani* are known to cause seed rot, seedling disease in onion, but available literature showed that this is the first report of *Rhizoctonia* spp. (Teleomorph-*Ceratobasidium* spp.) causing black scurf on onion bulb.

## Fusarium produces pink roots and scales: A new report

Pink root caused by *Phoma (Pyrenochaeta) terrestris* is a well known disease of onion that results in development of pink roots and is widely reported in literature too. When young garlic plants showing general drying and wilting were up rooted, pinkish roots were found associated in almost all the samples. Different degrees of pink pigmentation were observed depending on the severity of the disease. In advanced stage, roots turned dark brown to black. After isolation these samples yielded *Fusarium* sp., which was later, identified by ITCC as *Fusarium solani*.

At the time of harvesting pinkish scale in some bulbs were also found, which gave raise to the same fungus. Pink roots and pink coloured



↑ Pink roots from onion

scales were observed in some white onion varieties. After isolation similar result was obtained. Earlier, it was reported from Rajasthan that *F. solani* produces pink roots in onion. There is no available report so far that *F. solani* produces pink roots in garlic and pink colored scale in onion as well as in garlic.



↑ Pink pigmentation on garlic

## Perfect State of *Stemphylium vesicarium* developed in laboratory

*Stemphylium* leaf blight caused by *Stemphylium vesicarium* (Teleomorph- *Pleospora* sp.) is a serious problem in onion and garlic production. Though its perfect state *i.e.* *Pleospora* sp. is known to occur in nature, it is uncommon. NRCOG scientist succeeded in developing an easy method to produce sexual stage in laboratory.



↑ Pseudothecial primordia of *Pleospora* sp



↓ Asci and ascospores

## Mealybug on *Allium odorum*- A new record



↑ *A. odorum* infested with mealybug

Alliums are bestowed with great biodiversity in nature. One of the *Allium* species is *Allium odorum* (Alliaceae). Both bulbs and leaves are edible and are believed to have medicinal properties. The whole plant / juice acts as repellent to moths. It is also an ornamental plant with attractive flowers. Understanding the response to pests and diseases offers great scope for the improvement of Alliums.

During *rabi* season, striped mealy bug, *Ferrisia virgata* Cockerell (Pseudococcidae) (final confirmation required) was recorded on *A. odorum* plants that were grown under shade net. Entire plant was completely invaded by mealy bug. The colony comprised of eggs, crawlers and the adults. The adults were with two prominent filaments. Honeydew secretion was conspicuous on the infested plants.

## Transfer of technology

### Trainings

NRCOG has conducted following training programmes to agriculture officers and farmers

- Two, three-day training programmes on Onion & Garlic production technology to Agriculture Officers of government of Maharashtra were organized from 3–5 Jan and 8-10 Jan, 08 under National Horticulture Mission financial support.
- Two-day training programme on 'Onion & Garlic production technology' to farmers from Phaltan, Maharashtra, on 7 – 8 February, 2008 sponsored by Department of Agriculture, Satara district under "ATMA".
- Four-day training programme on 'scientific cultivation of Onion & Garlic' to the farmers of Maharashtra from 24 – 27 April, 2008 sponsored by Department of Agriculture, Jamner Taluka, Jalgaon district.

### Exhibitions

NRCOG participated in the following exhibitions to popularize developed technologies

- "Agriculture Exhibition –Science Day" at GMRT, Khodad, Junnar Taluka on 28 - 29 February, 2008 organized by GMRT-Tata Institute of Fundamental Research, Narayangaon.
- "Krishi Mahotsav- 2008" at Chandoli, on 2nd June, 2008, organized by Maharashtra State, Department of Agriculture, Rajguru-nagar.

## Institute meetings

### IRC Meeting

Eleventh Institute Research Committee meeting was conducted on 10-11 March, 2008 under the chairmanship of Dr. K. E. Lawande, Director, NRCOG. Results of the projects carried out during *rabi* 2006-07, *kharif* and late *kharif* 2007 were reviewed and technical programme for coming season was finalized.

B.H.U., Varanasi, Dr. R. D. Rawal, Principal Scientist (Plant Pathology) IIHR, Bangalore, Dr. Umesh Srivastava, ADG (Horticulture) ICAR, Dr. K.E. Lawande, Director, NRCOG, and Dr R. P. Singh, Senior Scientist & Member Secretary and all the scientists attended the meeting.

Director presented an over view of the centre's research activities and technologies developed. All the

scientists presented achievements of different research projects. The committee visited Otur village, where NRCOG has established linkage with farmers for the transfer of technology. The members were impressed by farmers' interaction and association of the centre with onion growers. During two-day meeting, the committee critically reviewed the progress, discussed the research projects and made recommendations for future work.

### RAC meeting

The XI Research Advisory Committee meeting was held on 28-29 March 2008. This was the first meeting of newly constituted Research Advisory Committee under the chairmanship of Dr. Brahma Singh, Former Director, Agriculture and Life Sciences, DRDO, New Delhi. All members namely, Dr. P. L. Tandon, Principal Scientist (Retired) (Entomology), PDDB, Bangalore, Dr. Kalyan Singh, Professor and Head (Agronomy),



### New colleague



NRCOG cordially welcomes Dr. Mrinal Kanthi Kuchlan who joined this centre as Scientist (Seed technology) on 16.5.08. He did M.Sc. (Ag) and Ph.D. in Seed technology from IARI, New Delhi.

### Distinguished visitors

Dr. A.K. Tiwari, Director, GOI, DPD, New Delhi	28 Jan 2008
Sh. S. P. Pathak, Director (Finance), ICAR, New Delhi]	12 May 2008
Sh. J. Ravi, Dy. Secretary, ICAR, New Delhi	9 June 2008



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