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DOGR news

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From Director's Desk

Year 2008-09 witnessed good onion and garlic production. There was record export of 16 lakh ton maintaining number one position in the world. Besides being high export, domestic supply was not impaired and farmers were happy with remunerative prices throughout the year. Garlic reached to its maximum as far as market prices are concerned. Reduction in growing area in Madhya Pradesh and Gujarat reduced total production by 30 per cent. As compared to last year, the current year's crop condition is not satisfactory. Monsoon delayed by one month in kharif. Kharif planting was late and again at maturity in the month of November it was hit by cyclonic rains for two days in Maharashtra and Karnataka. Prices of onion spiraled high and continued till December 2009. Late kharif planting is again affected by sporadic rains and cloudy weather. The arrivals are less that too with poor quality of bulbs. Rabi nurseries are late and seedling planting is still going on.

This indicates climate is changing and it is changing at a faster rate. Monsoon has become more erratic. Untimely rains, cloudy weather, warm temperatures, fog etc create favourable conditions for foliar diseases like purple blotch, stemphylium blight and colletotrichum. These diseases reduce yield by 30 to 50 per cent across different seasons. Amendment in cultural practices like planting on raised beds with drip or sprinkler irrigation and prophylactic sprays can ensure good crop up to some extent. However, real safety can be warranted through resistance breeding programme. Resistant genes are available in wild alliums *viz, A. fistulosum, A. altaicum, A. tuberosum etc,* however conventional breeding failed to incorporate gene in to *Allium cepa.* Biotechnological approaches are being tried for combining resistance in cultivated genotypes. In addition to the problems of foliar diseases, soil borne diseases *viz,* pink root, sclerotial rot, basal rot, bacterial rot are becoming limiting factors in some areas where intensive onion cultivation is being done without following crop rotations. Generally onion or garlic should be planted after three years of rotation in the same piece of land. For crop rotation, this Directorate has recommended soybean, bajra and mung bean in kharif followed by rabi onion or garlic. Among these pre-season crops, soybean and mung bean lately found to be infected by pink root in sick soils. There is need for trying other crops like mustard, radish, cabbage, cauliflower *etc,* which are not affected by these soil borne diseases. Soil enrichment with bio-agents like Trichoderma can also help in this regard.

Onion and garlic are highly labour intensive crops than other commercial vegetables. Transplanting, weeding and harvesting demand more labour and involve drudgery also. Partial mechanization is the need of the day. This Directorate is trying for direct seeding by pneumatic seed drill to avoid transplanting and to save on labour with the help of Central Institute of Agricultural Engineering, Bhopal. Besides this, trials are also going on for mechanized harvesting and grading in onion. In India almost 90 per cent onion is grown by transplanting. There is need for developing suitable transplanter also. Sh. Pandharinath More, an innovative farmer from Kopergaon, Ahmednagar has developed a transplanter. A prototype was developed and tried at this Centre. However, it needs further improvement in terms of working under different soil types, moisture conditions, positioning seedlings with soil support *etc.* A collaborative programme can be more meaningful.

Anthracnose

Purple blotch

Stemphylium blight

Research highlights

Allium tuberosum, a cash crop in Manipur

North Eastern States including Assam do not grow common onion on large scale. High rainfall and high humidity are the main limiting factors. Moreover commercialisation has not been done so far. The complete requirement of common onion of North East is met with onion transported from Maharashtra, Bihar, U.P. etc. In critical gap period from Sept -Feb, the prices of onion are very high. People of this region have developed habit of using wild species of *Alliums in lieu* of cultivable onion. Among wild species, *Allium tuberosum, Allium fistulosum* are common in use. These species are perennial in nature.

Leaves are cut regularly and used as spices in green as well as dried form. In Manipur, A. tuberosum is cultivated commercially. It is multiplied through seed as well as vegetable suckers of old plants which produce numerous pseudostems having 4-5 garlic like leaves. The seedlings or suckers are planted on raised beds and irrigated with the help of drip or sprinklers. In a year about 8 to 10 cuts are taken. Foliage is sold in one kg bundles. Farmers earn around Rs. 1.0 lakh from 500 sq. m area. There is great potential for export of green tops as well as dehydrated leaves. Besides A. tuberosum, there is good scope for Chinese chive also. ICAR has approved networking centre under the control of Directorate of Onion and Garlic Research, Rajgurunagar in Manipur in collaboration with Central Agricultural University,Imphal.

Director, DDGR and staff of networking centre at GAU, Manipur

Exploration and collection of onion and garlic germplasm

Variation in red onion

Surveys for collection of diverse onion and garlic germplasm from Karimnagar, Nizamabad and Adilabad districts from North Telangana region of Andhra Pradesh; Garchiroli, Chandrapur, Yavatmal and Nanded districts of Maharashtra; and Narainpur, Bastar and Dantewada districts of Chhattisgarh have been conducted between March - May 2009 in collaboration with NBPGR, Regional station, Hyderabad. A total of 212 accessions consisting of red onion, white onion and garlic were collected. In the surveyed areas, white onions are mainly grown in North Telangana region of Andhra Pradesh; Garchiroli, Chandrapur, Yavatmal and Nanded district of Maharashtra. Red onions are mainly grown in Narainpur, Bastar and Dantewada district of Chhattisgarh. In garlic white types are preferred in surveyed areas but, few accessions with purple colour were also collected. More variation was noticed in terms of colour, size and shape of onions and garlic from the tribal tracts of Adilabad. These lines will be evaluated under different breeding programmes.

Variation in white onion

With a focus on large sized, dark red, high yielding onion lines for kharif season, survey was also conducted in Satara, Pune, Ahmadnagar, Nasik and Dhule districts of Maharashtra during Nov, 2009. A total of 94 onion lines were collected.

Somatic embryogenesis in onion

Somatic embryogenesis is the developmental pathway by which somatic cells develop into structures that resemble zygotic embryos through an orderly series of characteristic embryological stages without fusion of gametes. It is an efficient and high volume propagation system for the production of large number of plants within a short period of time. Somatic embryogenesis offers several advantages in crop improvement, as cost-effective and large-scale clonal propagation is possible using bioreactors, ultimately leading to automation of somatic seed production and development of artificial seeds. In recent years, the success in inducing dormancy and the accomplishment of long term storage, together with the achievement of encapsulation of somatic embryo has opened up the possibility for their use in synthetic seed technology. Besides, such a system could also provide a new source for use in genetic transformation. Plants raised from somatic embryos are of single cell origin and embryogenic cultures can be synchronized and purified to obtain pure cultures of homogenous material which is more suitable for breeding and genetic analysis. Somatic embryogenesis provides huge number of individual embryos which could increase the probability of mutation many folds. Somatic embryos also appear to be more sensitive to the application of

Pneumatic seed drilling saves labour and time in onion

Director, DDGR and scientists of CIAE, Bhopal examining pneumatic seed drill

Onion is commonly grown in India through seedling transplantation. Moreover, raising nursery is a pre requisite and it consumes more time, labour and cost. Higher productMtywlth low input cost is one of the success keys in hamessing benefits of vegetables production. In Europe and USA precision seed planters are used, which cut down the input cost. However, these precision planters are very expensive and may not suit to the budget of our Indian farmers. Further, these are usually preferred for large scale cultivation and may not be convenient and economical for small holdings in India. No such specialized equipments are available in India for direct planting. Some prototypes for direct sowing of onion have been developed by farmers with the help of local artisans, but there is lack in precision and accuracy, and it is largely dependent on the skill of person who is performing sowing operation. Locally developed seed drills tested earlier at DOGR revealed that these indigenous, manually operated drills do not help in labour saving and precision particularly in case of sowing depth and spacing is not satisfactory. To overcome these problems, CIAE, Bhopal imported pneumatic seed drill from Italy. This seed drill is useful for direct sowing of all types of vegetables particularly onion, okra, carrot *etc.* ThiS versatile and multipurpose machine can be fitted with as many seeding units as needed to meet the specific requirements of the farmers and equipped with everything that is necessary to handle all the different types of seed. For the first time, a pilot experiment was taken up at DOGR farm, Rajgurunagar during current rebi season. Direct seeding of onion was successfully completed with this machine and observations are being recorded on precision, seed germination, crop stand *etc.* The perfomnance of the machine will be studied under different seasons in Mure.

exogenous chemicals and therefore can be used for *in vitro* screening to identify plant genotype resistant to toxins or other factors like drought or salt.

By keeping this all background information in view, the present research work was undertaken to standardize protocols for efficient somatic embryogenesis and plant regeneration in garlic. Being an asexually propagated crop with slow rate of multiplication and limited conventional breeding methodology for utilizing and creating genetic variation, somatic embryogenesis offers hope for garlic improvement in terms of speedy generation of variation through mutation, transgenic development, cryopreservation of germplasm and in vitro screening. The experiment was conducted on short day tropical variety G-41 and long day cultivar Agrifound Parvati. Root tips were used as explant sources and different combinations of auxins (2, 4-0, Picloram) and cytokinins (BA, Kinetin, TDZ and 2iP) using Gamborg's B5 medium were used for embryo induction, maturation and regeneration. 2, 4-0 alongwith BA was found to be suitable for embryo induction and proliferation whereas use of BA and kinetin was found to be suitable for embryo germination. The plants so obtained were transferred to the greenhouse for acclimatization and hardening. Further experiments to increase the frequency of somatic embryo regeneration are going on.

Recommended Pesticides leave no residues in onion

India is a major exporter of onion in the world. This important commodity is been exported to many parts of the world mainly to Middle East, Gulf and European Union and is mostly consumed as salad. Thrips tabaci is the major insect pest of onion. Chemical control is largely practiced by farmers to mitigate this pest problem. Frequent insecticide applications and indiscriminate use in some areas may pose greater threat of pesticide residues in the bulbs particularly in rabi season. To sustain the international competition amidst ever growing stringent norms against pesticide residues and increasing health awareness among the people, it is necessary to monitor the pesticide residues and generate information with respect to Indian onion. Even tender green tops of onion are also consumed as vegetable in our country. Therefore a comprehensive study was taken up by this Directorate to monitor and assess the pesticide residues in onions. Onion bulbs from different states of India were collected from markets and farmers and analysed for the residues. No insecticide residues were found in any of the market sample. A field trial conducted during rebi season with all commonly used insecticides also showed that when insecticides were applied at recommended doses up to 75 days after planting, it did not leave any residues on the bulbs at harvest. For consumption of green tops of onion, Spinosad was found the safest with only 2 days pre - harvest interval. Monocrotophos was found more persistent and needed longer pre- harvest interval among the insecticides. Results suggested that monocrotophos should be avoided if green tops are to be consumed.

हिन्दी सप्ताह

प्याज एवं लहसून अनुसंधान निदेशालय, राजगुरूनगर में दिनांक *14109/2009* से 19/09/2009 तक हिन्दी सप्ताह मनाया गया। इस दौरान 1. निबन्ध प्रतियोगिता : वृध्दा अवस्था में समस्यायें एवं उनका समाधान 2. वाद-विवाद : समलैंगिकता कितना नैसर्गिक 3. कविता पाठ 4. प्रश्न मंजूषा 5. भाषान्तर 6. श्रुलेखन प्रतियोगिताओं एवं हिन्दी कार्यशाला का आयोजन किया गया। समापन कार्यक्रम दिनांक 19/09/2009 को मुख्य अतिथि श्रीमती रेखा सिंह, हिन्दी अधिकारी, अनुसंधान तथा विकास स्थापन (इंजिनीयरिंग) कलस, पुणे (महाराष्ट्र) एवं निदेशक, प्याज एवं लहसून अनुसंधान निदेशालय, राजगुरूनगर की अध्यक्षता मे सम्पन्न हुआ। निदेशक महोदय ने मुख्य अतिथि महोदया को पुष्प गुच्छ, श्रीफल एवं शाल भेट दे कर स्वागत किया। निदेशक महोदय ने स्वागत भाषण में अपने उदगार प्रगट किये उसके पश्चात मुख्य अतिथि महोदया ने अपने अध्यक्षीय भाषण में हिन्दी से संबंधित उदाहरणो के साथ अपने भाव प्रगट किये । अन्त में विजेता प्रतियोगियों को पुरस्कार प्रदान किये गये एवं डॉ ए. जे. गुप्ता, वरिष्ठ वैज्ञानिक ने सभी के आभार प्रगट किया ।

Participation in exhibition

DOGR participated in agricultural exhibition KISAN 2009 during 14-18 December at Moshi, Pune organized by Kisan Forum Pvt Ltd and supported by Department of Agriculture, Maharashtra. DOGR stall invoked great response from farmers and large numbers of publications were sold out.

Institute meetings

IMC meeting

XIV IMC meeting was held on 08.12.2009 under the Chairmanship of Dr. K.E. Lawande, Director, DOGR. Members, Dr. B.R. Ulmek, Associate Dean, College of Agriculture, Pune, Dr. R.L. Sapra, Principal Scientist, IARI, New Delhi, Dr. S.J. Singh, Ex-Head, IARI- RS, Pune, Dr. S.S. Mehetre, DoR, MPKY, Rahuri, Mr. V.T. Awachat, Otur, Dr. C.R. Ramesh, Principal Scientist, DOGR, Mr. N. Gopal, Member Secretary and Ms. V.N. Chaudhari, AFAO as Invitee attended the meeting. After the welcome address, Dr. Lawande presented a detailed report along with research accomplishments. The committee expressed satisfaction about the functioning olthe centre.

Distinguished Visitors

Dr. K.L. Chadha, Former Deputy Director General (Horticulture), ICAR, New Delhi visited on 10.08.2009.

Dr. Ajai Kumar, Director (IC) & Chief Vigilance Officer, DARE, New Delhi visited on 07.10.2009.

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