

## A step towards prevention of onion shortage\*

Onion is being widely used since ancient times as salad and for seasoning food. An Indian culinary preparation is incomplete without onion. Onion also has medicinal values as it is antimicrobial, antioxidant, antiasthmatic, immunomodulatory and prebiotic. Although it is traditionally eaten both by the rich and poor, sometimes it goes out of the reach of the poor because of its high retail price which can be as high as Rs 100/kg as was observed in October–November 2013. There may be several reasons for this, but low productivity of the crop in India is one of the major reasons. Though India ranks first in area (10.64 lakh ha) and second in production (151.18 mt) in general, next only to China, in the case of onion productivity India is at 90th place with an average yield of 14.21 tonne/hectare (t/ha). The average onion productivity in China is 23.06 t/ha. The highest productivity of onion is in Ireland (67.33 t/ha) followed by the Republic of Korea (63.83 t/ha) and USA (55.26 t/ha). World's average productivity of onion is 19.47 t/ha (source: FAOSTAT).

India is projected to have a population of 1.7 billion by 2050, and there is no possibility of increase in cultivable land. To cater to the requirement of this ever-increasing population and keeping per capita consumption, export, processing and losses at the existing rate (consumption 6.7 kg/person/yr, export 9%, processing 6.75% and losses 30%; base year 2010–11), we will require 21.12 mt of onion in 2050 against 15.12 mt in 2010–11. This demands an increase in average productivity from 14.2 to 20.7 t/ha, which is about 40% higher than that in 2010–11. Efforts can be made to reduce losses up to 20%, increase exports up to 25% and processing up to 15% by 2050. With these targets, we have to increase the production from 15.12 to 28.57 mt with a productivity of 28.01 t/ha. In a recently concluded national brain-

storming workshop, N. Krishna Kumar (ICAR, New Delhi) took stock of the recent crisis of onion in the Indian market and the future requirement of this commodity. More than 100 delegates from across the country representing various institutions and agricultural universities as well private seed-producing companies attended the workshop. Jai Gopal (Directorate of Onion and Garlic, Research (DOGR), Pune) and R. P. Gupta (National Horticultural Research and Development Foundation (NHRDF), Nasik) were the organizers of this workshop.

The workshop was inaugurated by G. Kaloo (Ex-VC, JNKVV, Jabalpur and Ex-DDG (Horticulture), ICAR, New Delhi). He mentioned that low productivity of onion in India is one of the major reasons for the observed shortfall. Though there are many reasons for low yield, including short day length conditions available in India, sub-optimal standards of cultivation, weather vagaries, non-availability of quality seed and use of local low-yielding varieties are important among them. Krishna Kumar stressed on the need to augment onion productivity through genetic improvement and better seed supply, besides reducing storage losses of this perishable commodity.

Six lead lectures were delivered by renowned researchers from the public as well as private sectors, followed by open discussion. The deliberations were under two themes, viz. increasing productivity through (i) genetic improvement and (ii) higher production and supply of quality onion seeds. The open discussion that followed reviewed the present status of onion varieties cultivated in India and the availability of the quality onion seeds to improve productivity.

The workshop suggested that one option to achieve quantum jump in yield is through exploitation of heterosis. Uniformity in maturity, bulb colour, shape and size and storability are the other major advantages of the hybrids. Most of the area under onion cultivation in India is covered by open-pollinated varieties, whereas area under hybrids has increased in other countries. The cytoplasmic-

genetic male sterility system used worldwide in onion for hybrid production needs to be exploited. Though limited efforts in this direction have been made by the Indian Institute of Horticultural Research (IIHR), Bangalore, the workshop recommended that IIHR needs to join hands with DOGR to accelerate the development of the hybrids. The workshop recommended that inbred parents for developing onion hybrids can be produced as doubled haploids from induced gynogenic haploids. This will significantly reduce the time otherwise required for production of inbreds by conventional method. The workshop also recommended that concerted efforts should be made to diversify male sterility type and develop maintainers, restorers and molecular markers for this purpose. Keeping in view the likely high and recurring cost of single cross hybrids, the delegates discussed other alternatives of exploiting heterosis for enhancing productivity. In this context, the workshop recommended the development of synthetic varieties of onion. Such varieties with the ability to exploit heterosis, coupled with multiplication by open pollination and reuse of saved seed by the farmers can boost as well as stabilize onion productivity levels. Synthetics can be a good alternative till hybrid seeds are not available in sufficient quantity and at an economical rate as the cost of seed of a synthetic variety is expected to be relatively lower than hybrid varieties and farmers also benefit from multiplying own seeds for the next season.

The seed production of onion is a difficult phenomenon as it is produced in two phases. In the first phase, bulb production is required, while in the second phase seed production takes place from the bulbs. Organized onion seed production and distribution is not sufficient in India. The total production of onion seed by various government agencies is about 800 tonne, which is only 8–9% of the total requirement. The private seed companies are also producing nearly an equal quantity of seeds. About 80% of the seeds is being produced by farmers and traders without observing any standard for isolation. Thus the quality of seeds

\*A report on the National Workshop on 'Onion Improvement and Seed Production' held at National Horticultural Research and Development Foundation, Nasik on 15 March 2014.

supplied by the informal sector in most cases is poor owing to genetic impurity. The problem is further exacerbated by the short shelf-life of onion seeds. Since the price of onion seeds varies from year to year and seed companies are not sure whether they will be able to realize remunerative price, the production of onion seeds in sufficient quantities can-

not be assured. The workshop suggested collaborative efforts of public sector, private sector and farmer's groups to plan in advance so as to produce the required amount of quality seed for assured supply. Proper storage facility is also required both for onion bulbs and seeds to manage the supply chain according to demand. The issues related to cold stor-

age technology for onion bulbs and seeds were also discussed. The strategies suggested can boost onion productivity and stabilize onion prices.

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