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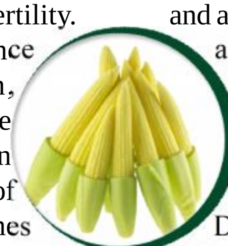
Baby corn: a new challenges and opportunity

A. H. Nanher[1], Shashidhar Yadav[2], Sachin Tyagi[3] and Ashutosh Kumar Singh[1]
[1]Department of Agronomy, Bihar Agricultural University, Sabour, BHAGALPUR (BIHAR) INDIA
(Email: angadnanher2012@gmail.com)
[2]Department of Agronomy, Rajendra Agricultural University, Pusa, SAMASTIPUR (BIHAR) INDIA
[3]Department of Horticulture (Fruit and Fruit Technology), Bihar Agricultural University, Sabour, BHAGALPUR (BIHAR) INDIA

Baby corn (*Zea mays* L.) is gaining popularity among the vegetarian people due to its nutritive value as vegetable. Immature cobs of baby corn are harvested for vegetable purpose. Since baby corn is a short duration (65-75 days) and new plant type, standardization of agro-techniques is needed to ensure the income of farmers. Space availability to the individual plant is necessary to use the soil resources effectively and to harvest the maximum possible solar radiation to attain higher yield. Though the spacing requirement of grain and fodder maize has been standardized, information on optimum crop geometry for baby corn that too under intercropping system is meager. Baby corn enters into the reproductive phase from 45-55 DAS and upto this stage, the available space, light, moisture and nutrients in soil could be utilized by raising suitable short duration intercrops, which is not only improve the main crop yield but also maintain the soil fertility. With rapid increase in population and less chance of bringing new land under cultivation, intercropping seems to be the only way to increase productivity and intensity land use. This situation warrants developing an appropriate technology of growing field crop in association with legumes without too much intercrops interference and competition. Intercropping of cereals with legumes has been popular in tropics (Tsubo *et al.,* 2005). It is used as ingredient in most food preparations. It has nutritive value similar to that of non- legume vegetable such as cauliflower tomato, cucumber and cabbage. This vegetable has a great potential for cooking purposes and for processing as a canned product. Canned cob corn export to Thailand, Japan and Europe is increasing and has a good future. Generally, maize farmers strive by improving yields and cutting costs of production, for instance, through shortening cultural risks by harvesting for either green corn or baby corn. Young cob corn has a short growth thus, a farmer can grow four or more crop cycles per year. It has a wide range of adaptation and does not need intensive cultivation. Considering these factors, young cob corn has good potentials.India has traditionally been a livestock-rearing country. Neglect of forage crops led to a decline in the productivity of livestock. According to the National Commission on Agriculture, the green fodder requirement for the existing livestock in India is around 1136 Mt, whereas the availability is 695 Mt, indicating a 61 per cent deficit in fodder supply (Singh and Roy, 1999). Further, fodder availability in the wet season is scarce and costly. By-products of baby corn such as tassel, young husk, silk, and green stalks are good cattle feed. Again, for diversification and value addition of maize as well as the growth of food processing industries, an interesting recent development has taken place with regard to growing maize as baby corn.



Challenges : India would be the largest economy of the world, most populous nation of the planet and a majority of its population would be living in the urban areas. The pressure of population, a severe natural resource crunch and an impending ecological decline may trigger a major agricultural crisis, unless we act now and bring in paradigm scientific interventions to deal with these issues. Bridging yield gaps and incremental gains by improved management practices may help us to enhance production by a few years. Development of high yielding cultivars with built-in higher level of resistance against biotic stresses is a daunting task. This becomes all the more challenging due to unpredictability of plant-pest-natural enemies interaction in the context of changing climate.

Abiotic and biotic stresses : Improving the genetic potential of baby cornwould be a major challenge. Today, hybrids with yield potential of up to 10,000 kg/ha are available. However, it becomes difficult to achieve even half of this potential because of high incidence of biotic and abiotic stresses in farms. It is clear that the major challenge in germplasm enhancement lies in introducing stress tolerance traits.

Natural resources degradation : The natural resources degradation, fading organic carbon from soil, declining factor productivity, decreasing farm land due to more land under non-agricultural uses in future and profitability due to escalating input prices in agriculture production will further aggravate the problem of sustaining maize production systems.

Enhanced feed and fodder requirements : Fodder is an important issue as the country is presently facing a net deficit of 61 per cent for green fodder. In the absence of nutritious fodder, the farmers are feeding their cattle with low quality roughage or rice straw thus, adversely affecting the milk production potential of the animals.The competition for land and meeting the feed and fodder need for the support of livestock and poultry production will be another challenge in this scenario.

Opportunities : In comparison with other major grain crops, maize has benefitted to a great extent by new technological opportunities. Today, the most robust hybrid seed technology is available in maize and the highest number of transgenic events has been approved for this crop. In future also, maize is expected to rapidly absorb new technologies and play a pivotal role in addressing the issues facing the humanity by 2050.

Ethanol production : Ethanol potential of maize can be dramatically increased if its cellulosic biomass can also be converted into fuel. This would be possible by cell wall engineering and synthetic biology techniques. Maize based cellulosic ethanol will not only help us achieve =agri-based energy security 'but also it will transform rural India by diverting enormous petrodollars to the farmers. By 2050, maize would not only provide food, feed and fuel, but also it would be a source of recombinant pharmaceuticals, biopolymers and biodegradable plastic.

Improved production technology : There are considerable losses of nutrient and water in agriculture production in India. It can be minimized by the development and use of conservation agriculture based crop production practices, sensor based nutrient and water management, decision support tools and agro-ecological niche specific agronomic practices.

Next generation mutation techniques : Techniques like, mutant-assisted gene identification and characterization (MAGIC) and targeting induced local lesions in genomes (TILLING) allow identification of single-base-pair (bp) allelic variation in a target gene in a high-throughput manner. In future, TILLING would provide a powerful approach for gene discovery, DNA polymorphism assessment, and plant improvement. It represents an extension of the use of spontaneous and induced mutants in plant breeding 15.

Genetic engineering : The area under transgenic cultivars would enlarge manifolds in India and the world, and even more importantly, number of transgenes and transgenic traits in one cultivar would multiply. This would necessitate a shift from the present day genetic engineering to the futuristic =genome engineering'. Emerging technologies of today like, maize mini-chromosome (MMC), polycistronic transgenes, polyprotein expression systems, marker-free transgenesis, marker excision, targeted mutagenesis and many others which enable gene stacking and precise modification, would blossom it would be routine to make site-specific modifications to the plant genomes, including targeted mutations, gene insertions, and gene replacements etc.

Biotic stresses : Advancement in the field of biotechnology will help us manage biotic stresses by developing improved strains of bio control agents. The long term strategy to manage the losses due to disease should involve Biotechnological tools for identification of genes against major pathogens and cloning of resistant gene(s) from different donors and their utilization in elite parental lines through gene pyramiding using marker assisted selection and conventional breeding approaches. Besides food safety issues like mycotoxin contamination of grains due to moulds is a major constraint and health hazard to humans and animals which needs to be addressed in the coming years. Development of detoxification protocol by utilizing microbial agents/ non-toxic chemicals is also a new opportunity to manage biotic stresses.

Nanotechnology : In coming decades nanostructure catalysts will be available which will increase the safety and efficiency of pesticides allowing lower doses to be used it has the potential to revolutionize maize systems with new tools for molecular treatment of diseases, rapid disease detection, enhancing the ability of plants to absorb nutrients etc. Smart sensors and smart delivery systems will help in combating major maize pests and pathogens. The pesticidal properties of nano-particles of various elements will be studied so that they can be utilized as an alternative to chemical pesticides.

References :

Abbas, M., Tomar, S. and Nigam, K.B. (1995). Maize *(Zea mays*) based intercropping system with pulses under rainfed condition. *Indian J. Agric. Sci.,* **65** (1): 34-38

Singh, P. and Roy, M.M. (1999). Agro forestry and rangeland development. In: R.L. Yadav, P. Singh, R. Prasad, I.P.S. Ahlawat, (Ed.), *Fifty Years of Agronomic Research in India*. Indian.

Society of Agronomy, IARI, New Delhi, pp. 221–254.

Tsubo, M., Walker, S. and Ogindo, H.O. (2005). A simulation model of cereal-legume intercropping system for semi-arid regions. *Field Crops Res.,* **93**: 23-33.

Vision 2050 Directorate of Maize Research (2014).

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