

A Review :

## Hybrid seed production in vegetables

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Accepted : May, 2009

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**Key words :** Vegetables,  
Hybrid seed production

Although, India is the world's second largest producer of vegetable crops next only to China but average availability of vegetable is still 185g/capita/day which is far less than the Recommended Dietary Allowances (RDA) of 300g/capita/day as per the dieticians and nutritionalists (Bagchi and Hazra, 2005). F<sub>1</sub> hybrid seems to be the only solution as there is limited scope of increasing area of vegetable cultivation. Indeed highly significant advances have been made in the development of F<sub>1</sub> hybrids in the vegetable crops in the recent past, which has improved the productivity many folds without sacrificing the quality. Beside several factors, the success of hybrid crop is always dependent on the success of hybrid seed production technology. For economic seed production available genetic tools have not been fully exploited in vegetable crops with few exceptions. Cost of F<sub>1</sub> seed production can be brought down considerably, if practical applicable pollination control mechanism like functional male sterility in tomato and brinjal, stable genic male sterility with marker character in watermelon, muskmelon etc. to avoid the selfing and maximize out crossing is resorted in the hybrid seed production field. For example, in tomato sharp reduction in labour expenditure of hybrid seed can be achieved by the elimination of manual emasculation process, as it represents 40% of the total expenditure (Hazra *et al.*, 2005). Heterosis for yield and other important traits in F<sub>1</sub> hybrids of Tomato (Kaur, 2002), Chilli (Singh and Hundal, 2001), Sprouting Broccoli (Singh *et al.*, 2006), Cauliflower (Garg and Tarsem, 2005) and Watermelon (Bansal *et al.*, 2002) etc. have been reported.

Although India is the world's 2<sup>nd</sup>

largest producer of vegetables next to China but intake of vegetable is still far less than recommended diet. India will need to produce 215 mt. vegetables by 2015 to meet the demand of domestic and export markets. In order to meet such a huge demand the only solution in front of us is to use the F<sub>1</sub> hybrids as there is limited scope of increasing the area of vegetable cultivation. Indeed highly significant advances have been made in the development of F<sub>1</sub> hybrids in the vegetable crops in the recent past, which has improved the productivity many folds without sacrificing the quality. In addition to this, these hybrids give early and uniform crop. These hybrids have also helped in decreasing the use of insecticides and pesticides, as many of these hybrids are resistant to the insect-pest and diseases. Many of these hybrids perform well under conditions of stress like drought, alkalinity, salinity etc.

### ***Current status of F<sub>1</sub> hybrids in vegetables:***

The share of hybrid varieties in several vegetable crops has gradually been increasing. Realising the potentials of vegetable hybrid technology in India, Indian Council of Agricultural Research initiated a network project entitled "Promotion of hybrid research in vegetable crops" during 1995-96. This project was initiated in 9 vegetables *viz.* tomato, brinjal, chilli, capsicum (bell pepper), okra, onion, cabbage, cucumber and Bitter gourd with the objectives (i) To promote hybrid research in order to increase productivity *per se* the country. (ii) To incorporate biotic stress resistance in the hybrids. (iii) To strengthen the hybrid seed research and hybrid seed production technology, (iv) To test the proven hybrids for their potentiality and (v) To establish