



## Doubling maize (*Zea mays*) production of India by 2025 – Challenges and opportunities

O P YADAV<sup>1</sup>, B M PRASANNA<sup>2</sup>, P YADAVA<sup>3</sup>, S L JAT<sup>4</sup>, D KUMAR<sup>5</sup>, B S DHILLON<sup>6</sup>,  
I S SOLANKI<sup>7</sup> and J S SANDHU<sup>8</sup>

ICAR-Indian Institute of Maize Research, Pusa Campus, New Delhi 110 012

Received: 22 October 2015; Accepted: 18 December 2015

### ABSTRACT

Maize (*Zea mays* L.) is a commodity of high economic significance in India. Its demand and production is increasing more rapidly as compared to other major commodities. It is estimated that by 2025, India would require 50 million metric tonnes (MMT) maize grain, of which 32 MMT would be required in the feed sector, 15 MMT in the industrial sector, 2 MMT as food, and 1 MMT for seed and miscellaneous purposes. Over this, there would be about 10 MMT of export potential also. Thus, in the next 10 years there is a necessity and opportunity for doubling India's maize production from the current level of approximately 25 MMT. Prevalence of yield limiting biotic and abiotic stresses, lower adoption of modern production technologies in certain regions, extension and policy gaps, etc. remain major challenges before the Indian maize sector. Therefore, strong technological and policy interventions would be required to achieve the goal of doubling maize production. By 2025, productivity level of 5-6 tonnes/ha need to be targeted, in order to double the production without significant increase in acreage. Technological interventions like cultivar development and diversification, incorporation of stress resilience in the germplasm, accelerating the breeding process through new tools, and adoption of modern cultivation and protection practices including conservation agriculture technologies would play a key role in increasing the productivity. At the same time, policy interventions like strengthening of post-harvest handling infrastructure, price stabilization mechanisms, and value chains, streamlining of extension system, augmenting hybrid seed delivery mechanisms, appropriate policy on genetically modified seeds etc. will be essentially required.

**Key words:** Demand, India, Maize, Production, Productivity, Projections

Maize (*Zea mays* L.) is the third largest grain crop in India, after rice and wheat. It is cultivated in an area of 9.09 million hectares (M ha), has an annual production of 24.26 million metric tonnes (MMT), and an average national productivity of 2.56 metric tonnes per ha (tonnes/ha) (Yadav *et al.* 2015). It is grown during rainy (*khari*), winter (*rabi*) and spring seasons, but major production is in the rainy season. Maize has wide ecological adaptability and is grown in almost all parts of the country, though Andhra Pradesh (20%), Karnataka (17%), Maharashtra (11%), Bihar (9%), Tamil Nadu (8%), Madhya Pradesh (6%), Rajasthan (6%) and Uttar Pradesh (5%) are the major maize producing states.

Maize is the principal feed crop of the country. About 59% of the total production is used as feed, while the remaining is used as industrial raw material (17%), food (10%), exports (10%), and other purposes (4%) (Kumar *et al.* 2013). Because of its diverse uses in the feed, industry

and food sectors, maize is considered as an internationally important commodity driving world agriculture. Globally, it is grown in 184 M ha across 165 countries, with total production of 1 016 MMT, and average productivity of 5.52 t/ha (FAOSTAT 2014). It has emerged as the most-produced grain in the world, surpassing rice in 1996 and wheat in 1997. Its production is increasing at twice the annual rate of that of rice and three times that of wheat (Fischer *et al.* 2014).

During 1950-51, India produced only 1.73 MMT maize. In the next eight years, the maize production was doubled, touching 3.46 MMT in 1958-59. This increase was due to expansion in area and enhancement of yield. During this period, the area under maize cultivation increased by 35%, while the yield increased by 48%. It was also relatively easier to enhance the production on the back of a low base for both area and productivity. In 1970-71, maize production of India once again doubled to reach 7.49 MMT. During this period also, there was increase in both acreage (37%) and productivity (58%), though the enhancement in latter had greater contribution in doubling the maize production. The maize production of the country doubled again to 14.98 MMT in 2003-04 (Fig 1). During this period, maize area

<sup>1</sup>Director (e mail: opyadav21@yahoo.com); <sup>2</sup>Director, CIMMYT; <sup>3,4</sup>Scientist, IIMR; <sup>5</sup>Principal Scientist, ICAR; <sup>6</sup>Vice-Chancellor, PAU, Ludhiana; <sup>7</sup>Assistant Director General, ICAR; <sup>8</sup>Deputy Director General, ICAR.