Introduction

Maize (*Zea mays* L.) is an adaptable, high-yielding and fast-growing important cereal crop suitable for wider production as grain crop. Recently, it is being grown for diverse uses and specialty purposes. Such maize for specialty and value added purposes are collectively called specialty corn. Compared to field corns, specialty corns possess additional and characteristic features. Their global spread, increasing demand and premium price make them an attractive option for the farmers in many countries including India. Specialty corns are amenable to numerous options pertaining to harvest time and various economical products. Maize with respective quality parameters relating to tender ear characteristics, biochemical components relating to protein, sweetness, starch, oil and popping traits are considered as specialty corn (Table 1).

Table 1. Characteristics of different specialty corn

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<th>Type of maize</th>
<th>Specific characteristics</th>
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<td>Baby corn</td>
<td>Baby corn is the ear of maize plant harvested young, especially before or just after the silk emergence. Currently maize cultivars originally developed for grain usage are grown for baby corn purpose. The dehusked ears are crisp, sweet, succulent, delicious and can be eaten as salad vegetable. Baby corn is free from pesticide and</td>
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<td>nutritional value is comparable to other vegetables. After harvest the plant by-products, such as tassel, young husk, silk and green stalk provide good cattle feed. It generates employment among the rural poor of all ages. Baby corn is a good option for crop diversification. It suits best to peri-urban agriculture. It offers great potential to earn foreign exchange through export of fresh/canned baby corn and its processed products.</td>
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**Sweet corn (Zea mays var. saccharata).**

Sweet corn is genotypes with specific endosperm mutation like *su* and *sh*. In India, sweet corn green ears of field corn are consumed. Standard sweet corn at the immature, milky stage contains about 10 percent sucrose, while field corn in the same stage has about 4 percent sucrose. After harvest or if left on the stalk too long, sucrose in standard sweet corn is rapidly converted to starch. Sweet corn kernels often have a wrinkled and glassy appearance resulting from a sugary gene which retards the normal conversion of sugar to starch during endosperm development. Kernel colors vary, sometimes being mixed both white and yellow. Freshness increases the pricing. To compete and find a nearby niche (like restaurant or roadside stand) for sweet corn, entrepreneurs should explore the potentials of moving these corns to consumers within a day of harvest. These kernels at room temperature can lose as much as 50 percent of their sucrose by 24 hours after harvest.
Popcorn (Zea mays everta) | Popcorn is a popular snack cereal possessing specific popping features and related quality traits. It is generally pearl or rice type. Pearls have smooth and rounded crowns, while rice types are pointed. Heating the kernel turns the moisture inside the soft starch in the centre into explosive steam that can turn the kernel inside out. The greater the expansion, higher the quality. Moisture content should be 13.5 to 14 percent for best results. Varieties differ in flavour, tenderness, absence of hulls, colour and shape. Shapes can vary from mushroom, spherical to butterfly. The confectioneries prefer spherical ones which is easier to coat with flavours or syrups. The butterfly shaped popcorn has a better "mouth feel" and is preferred for snacks.

Quality Protein Maize (QPM) | QPM is genotypes with 2-3 times increased levels of two essential amino acids-lysine and tryptophan. This protein alteration is controlled by a single recessive gene, Opaque-2, discovered in 1964.

Waxy corn | Waxy corn contains 100 percent amylopectin whereas normal corn contains 75 percent amylopectin and 25 percent amylose. Amylopectin is a form of starch which consists of branched glucose subunits whereas amylose is made up of unbranched glucose molecules. The waxy trait is controlled by a single recessive wx gene. Waxy corn is used by wet-corn millers to produce waxy corn starch which is utilized by the food industry as a stabilizer/thickener.

High amylose corn | This corn has amylose content higher than 50%.
High amylose corn is grown exclusively for wet-milling. This starch is used in textiles, candies and adhesives.

| High oil corn | High oil corn has approximately 7 to 8 percent oil. Additionally, protein quality and quantity are increased to some extend in high oil corn. This is because the germ size is larger and it contains protein of higher quality than the endosperm. The high oil trait is controlled by polygenes. Highly polyunsaturated and high linoleic acid content of corn oil makes it an excellent energy and essential fatty acid source for both humans and livestock. |

**Strategy of Production and Consumption**
Production practices for producing maximum grain yield using specialty corn hybrids are similar to those for field corn hybrids. Good fertility, adequate weed control and proper planting date are necessary to produce maximum yields. The characteristics of specialty corns warrant consideration. Care must be taken to avoid cross pollination with normal hybrids. If cross pollination occurs, the cross-pollinated ears of the specialty corn hybrids will produce normal seed and the seed of the hybrid will have the quality trait percentage intermediate between the field and specialty corn hybrid. To avoid cross pollination, specialty hybrids should be grown in an isolated field or the grain from the border rows should be harvested separately from the rest of the field. Additionally, these specialty hybrids should be grown following crops other than corn to avoid volunteer corn. The potential grain yields of specialty corn hybrids are generally lower than those of field corn. However, quality traits of specialty corn provide competitive advantage over field corn yield. Specialty corn yields vary depending upon location. Test weight can also be lower in QPM than normal maize hybrids so care must be taken to select a hybrid with adequate test weight. To address major limitation of low productivity, initiatives are being made to develop single cross hybrids in specialty corn. Utilizing elite hybrids with higher productivity
and quality would facilitate faster spread and popularization of specialty corn to different stakeholders. The huge potentiality of each specialty corn through hybrid technology would facilitate better harnessing multiple benefits. Specialty corn takes advantage of available resources in a more judicious way. It requires special efforts to study value chains and associated market opportunities. Depending upon the actual conditions in a growing season and local market situation, farmers can plan harvesting. Progress in establishing specialty corn research and

(a) View of detasseled field for baby corn production
(b) Baby corn ears; husked and dehusked
development would be fostered by transferring technology through public awareness campaigns. Urbanization, rising incomes and convenience foods are enhancing demand of specialty corn. The processing sector can be promoted through streamlined production, market development, focus on production advantages and customer requirements. To strengthen competitiveness, the industry needs to develop quality; reduce post harvest damage by improving on-farm mechanization and labour skills; introducing better storage especially cold storage technologies; enforcing market standards; overcoming inconsistencies in supply (labour availability, seasonal peaks) and providing greater incentives to growers. In the longer run this agro based industry will need to stimulate customer demand using more targeted marketing and niche products to overcome price sensitivity, develop brand reliability and cross-marketing to counter pricing strategies of competitor countries.