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QUALITY PROTEIN MAIZE (QPM): CULTIVATION, NUTRITIONAL BENEFITS AND USES

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ARTICLE ID: 034

QUALITY PROTEIN MAIZE (QPM)

Maize (*Zea mays* L.) is the most important cereal crops after wheat and rice. It is the staple cereal food throughout the world. Maize have a wide range of uses such as a source of human food, animal & poultry feed and industrial products; primarily as starch, in brewery & seed *etc*. Keeping in view the several uses, it was realized to improve the biological value of protein in existing maize genotypes. In this regard, new corn type known as **'Quality Protein Maize' (QPM)** was developed by lowering the concentration of zein (by 30 %), the result was that the concentration of two essential amino acids *viz.* lysine and tryptophan in maize grain was increased in QPM genotypes as compared to normal grain maize genotypes. The balanced proportion of all these essential amino acid in Quality Protein Maize (QPM) enhanced the biological value of protein which is higher among all cereals.

Maize Crop and Cob

Further, Quality protein maize (QPM) is a type of maize, which is genetically modified with *o2* mutant gene and other numerous modifiers along with enhanced level of tryptophan &lysine content, which are also responsible for the kernel hardness. On the basis of the presence of *o2* in the homozygous recessive *(o2o2)* state, breeders are able to obtain and

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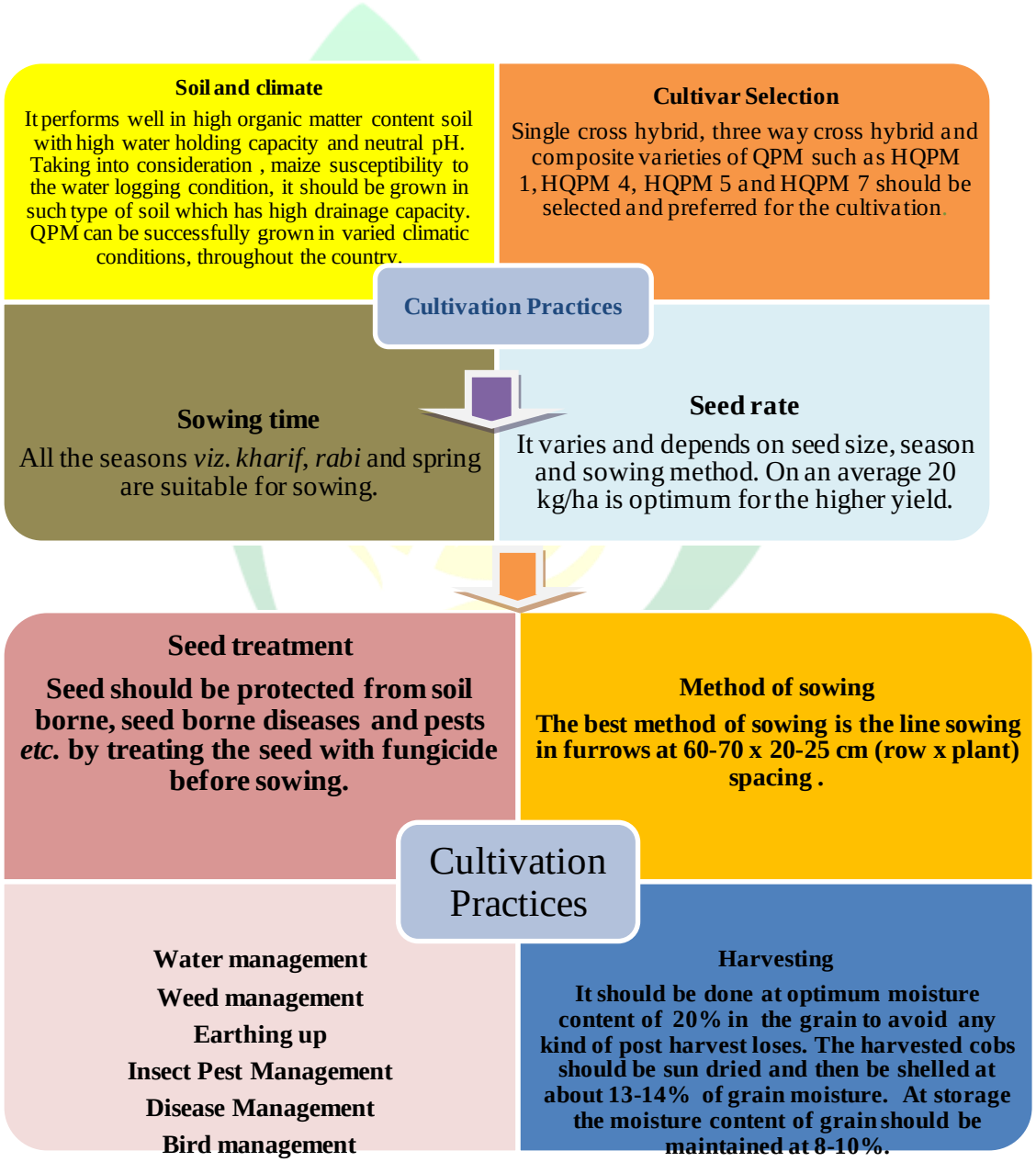
produce the maize genotypes with high levels of lysine and tryptophan amino acids. Transfer of this *o2o2* gene through breeding, selection and pyramiding the amino acid modifier genes, further ensures the concentrations of these amino acids at high level which is observed in the *o2* mutants. Due to all these characteristics; QPM, as compared to normal maize, exceeds in theproduction, productivity and quality. It is more beneficial for the farmers as assessed over normal maize.

CULTIVATION PRACTICES



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Seed production (QPM)

The strict standards for the different classes of seed must be followed to ensure good quality seed reproduction in QPM. It is easily vulnerable to genetic contamination throughout crossing due to single recessive gene *(o2o2)* coupled with many complementary modifier genes. So, the laboratory analysis for tryptophan and protein determination is essential to ensure that the content of the two amino acids are as above the required minimum amount. The protein quality, after every two years, is highly recommended in case of foundation seed multiplication.

QPM: Advantages

- It is an affordable source of balanced protein diet to the millions of rural and poor families which depend largely upon maize for their daily need of dietary protein & calorie intake.
- Several nutritional studies have demonstrated and recognized the potential of QPM to eliminate the risk of protein malnutrition especially in the maize consuming populations.
- Protein quality of QPM is highest among all cereal staple foods consumed by humans.

Food and nutritional security

- If we compare, most of the modern varieties of tropical maize with QPM, it is found that QPM produces 70-100% more of lysine and tryptophan content. These two amino acids allow and help the body in manufacturing the complete proteins and hence eliminate the protein malnutrition..
- QPM has the utility in food and nutritional security in fulfilling the requirements of protein in diet to prevent malnutrition.

Nutritious feed

- Maize acts as the major source of feed indicating the growing demand of maize all over the world. In India, about 49% of the total maize production is consumed and used as a feed in the poultry sector.
- Quality Protein Maize (QPM) due to its nutritive profile with high amount of carbohydrates, fats, quality protein, vitamins and minerals acts as a nutritious feed for poultry, livestock, swine and fish, *etc.*

Maize based entrepreneurship

- The products developed from QPM are highly nutritious and can be prepared in villages also. In this way, these products may become a great source of rural entrepreneurship as these products can replace costlier industrial food products.
- There is a great scope of generation of employment in QPM based rural industries to contribute for rural prosperity.

Benefits of QPM

- ✓ High nutritive value as compared to normal maize grain.
- ✓ Balanced nutrition for human consumption.

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- ✓ High Biological value over cereals and pulses.
- ✓ Generation of employment for village people.
- ✓ Eco-friendly in terms of cultivation.