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Pigeonpea Cultivation for Diversification in India

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Crop diversification is generally viewed as a shift from traditionally grown less remunerative crops to more remunerative crops. It gives a wider choice in the production of a variety of crops in a given area so as to expand production related activities on various crops and also to lessen risk. Among the legumes, pigeonpea is more feasible to tolerate drought conditions. Pigeonpea is modifying the soil fertility by fixing atmospheric nitrogen. So, it can be used as mixed crop and can be used as substitute for rice in wheat-rice system.

Introduction

Crop diversification in India is necessary to meet the challenges of a globalizing market in agriculture as well as the growing and changing needs of the population by enhancing the productivity and cultivating high value crop with positive outcome. In India it is generally viewed as a shift from traditionally grown less to more remunerative crops. Diversification is taking place either through area augmentation or by crop substitution. If carried out appropriately, it can be used as a tool to augment farm income, generate employment, alleviate poverty and conserve precious soil and water resources.

Pulses are excellent crops for diversification of cereal based cropping systems. Pulses are basic ingredients in the diets of a vast majority of Indian population as they provide a perfect mix of high biological value when supplemented with cereals. Importance of pulses is relatively more in our country as its contribution in nutrient supply is far more than that in Asia and world as a whole. Each plant of a pulse crop is virtually a nature's mini nitrogen fertilizer factory, which enables it to meet its own requirement and also benefit the succeeding crops. In addition, pulses are excellent feed and fodder for livestock. Besides their dietary value and nitrogen fixing ability, pulses also play an important role in sustaining intensive agriculture by improving physical, chemical and biological properties of soil.

Among the legumes, pigeonpea (*Cajanus cajan* L.) or arhar is a multipurpose crop, used for fodder, soil fertility enhancement, soil erosion control and for fuel (Janboonme *et al.*, 2007). It is more feasible than any other possible pulses due to its special characteristics. It has high ability to tolerate drought conditions can be used as mixed crop and grow on unconventional land like homesteads, roadsides, public places and borders of crop fields (Kalaimangal *et al.*, 2008). The progressive decline in per capita availability of pigeonpea in India is a matter of great concern. This is attributed to steady marginalization of pigeonpea cultivation in the wake of "Green Revolution" and burgeoning population with assured supply of cereals at an affordable price. In the pre-green revolution period, pulses found significant place in inter/ mixed cropping with major and minor cereals. Wheat was used to be generally grown with chickpea, lentil,

mustard and other oilseed crops. Similarly, the coarse cereals were grown with short duration pulses like urdbean and mungbean in intercropping/mixed cropping systems. After introduction of high yielding, short stature, photo and thermo-insensitive varieties of wheat and rice in sixties, the entire agricultural systems of country witnessed a change. The low productive, risk prone legumes and oil seed crops were diverted on marginal and fragile land of dry areas, whereas the cereal based multiple cropping systems covered irrigated areas in Northern India. Soil health has got deteriorated due to these crop systems hence, crop diversification and inclusion of pulses in the system is the need of the hour.

Now-a-days pigeonpea is being taken as substitute for rice in wheat-rice system. In the irrigated areas of the northern and central India, pigeonpea-wheat has emerged as a promising system. Availability of short duration varieties such as UPAS 120, Manak, ICPL 151, Pusa 992, which takes about 120-160 days to mature has enabled their introduction in rice-wheat systems in irrigated area of western Uttar Pradesh, Punjab, Haryana, Delhi and North-East Rajasthan. This has provided desired stability and sustainability to productivity of cereal based cropping system. Extra-short-duration pigeonpea genotypes could contribute to higher productivity of pigeonpea-wheat rotation systems. Most of the farmers who grew on-farm trials in Sonapat in Haryana, preferred extra-short-duration to short-duration pigeonpea types for their early maturity, bold seed size, and the greater yield of the following wheat crop (Dahiya *et al.*, 2002). Even intercropping systems are very common in central and western part of India. The short and early maturing cereals such as sorghum, maize and millets accumulated dry matter and utilized resources during the initial slow growth period of pigeonpea. As the reproductive growth of these intercrops does not coincide with pigeonpea, the yield of cereals is not affected adversely. After harvest of cereals, pigeonpea growth is compensated and additional pigeonpea yield is obtained. In central and peninsular India, sorghum + pigeonpea and pearl millet + pigeonpea has been found to be the most productive system, respectively. Sowing of one row of sorghum followed by one row of pigeonpea gave additional yield of sorghum besides giving normal yield of pigeonpea. This system also reduced the wilt incidence in pigeonpea crop (Ali and Singh, 1997).

Conclusion

Pigeonpea can play an important role in crop diversification in cereal based rotations and used as alternative for rice. It helps immensely in improving the soil fertility by fixing atmospheric nitrogen. It is becomes of great importance as Government of India is pushing hard for crop diversification in India.

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