

Potentiality of Pigeon Pea in Karbi Anglong District of Assam

Prakshipta Boruah¹, Shourov Dutta² and Ranjit Kumar Saud³

¹Subject Matter Specialist (Agronomy), Krishi Vigyan Kendra, Karbi Anglong, AAU, Assam

²Subject Matter Specialist (Horticulture), Krishi Vigyan Kendra, Karbi Anglong, AAU, Assam

³Associate Director of Extension Education (P & I), Directorate of Extension Education, AAU, Assam

SUMMARY

Pigeon pea, commonly known as *Arhar* or Redgram is an important pulse crop and has gained importance in the global basis for its versatile potentialities. It has a high nutritional value and holds the key to sufficient protein supply among the pulses. In addition, this legume boosts up soil fertility, adapts to drought and possesses various medicinal properties. It can be utilized as a host crop for rearing of lac insect and can be fitted into different intercropping systems. Thus, there is a need to promote and commercialize this multipurpose pulse crop for betterment of the farming community and improvement of both rural and urban livelihood.

INTRODUCTION

Pigeon Pea (*Cajanus cajan*) is a tropical legume crop with a huge potential in the Karbi Anglong district of Assam. Locally known as *Thekek* in Karbi language, it is cultivated in 691 hectares in East Karbi Anglong with a production of 529 MT and average productivity of 7.65 quintals per hectare whereas the total acreage in West Karbi Anglong is 620 hectares with a production of 473 MT and productivity of 7.63 quintals per hectare. It is mainly consumed as *daal* or in the form of green seeds as vegetables. For it has the ability to tolerate drought, it can be grown as a component of climate resilient agriculture. It plays an important role by preserving the income of the resource-poor farmers through enhancing both food and feed security, particularly as a major protein source in balancing the cereal-based diets to overcome the nutritional deficiency among the people.

The significance of this crop and its potential aspects in the district are discussed below:

(1) Nutritional benefits for human and livestock:

Pigeon pea is an important source of protein among all the pulses. The protein content of commonly grown pigeon pea ranges between 18 to 26% (Swaminathan and Jain, 1973) while up to 30% has been reported in other closely related *Cajanus spp.* (Reddy *et al.*, 1979). However, according to FAO (1982), this legume contains 20-22% protein, 1.2% fat, 65% carbohydrates and 3.8% ash. Besides, it is also a rich source of crude fibre, iron, sulphur, potassium, manganese and water soluble vitamins like thiamine, riboflavin, niacin (Saxena *et al.*, 2010, Sinha, 1977). Thus, to overcome the challenge of nutritional deficiency among the people of the district, pigeon pea can be considered as a good option for inclusion in the diet as *daal* or vegetable. Moreover, its foliage has high nutritional value which can be used as fodder for livestock (Onim *et al.*, 1985). The seeds are also very beneficial for cattle, poultry and pigs. It is reported to contain 5 to 10 % crude protein and 2 to 4 % fat and ash (Sharma *et al.*, 2011).

(2) Increases soil fertility status:

The soils of Karbi Anglong are generally low to medium in nitrogen content. Moreover, practice of *Jhum* (slash and burn) cultivation is still prevalent in this hill zone of Assam which depletes organic carbon and nitrogen in soil. Under such condition, pigeon pea can offer its benefits of enhancing soil quality and fertility. It is endowed with the unique feature of fixing atmospheric nitrogen which increases the fertility of the soil. About 235 kg nitrogen per hectare can be fixed by this leguminous crop (Peoples *et al.*, 1995) and it also has the ability to produce more nitrogen per unit area from plant biomass than other legumes (Sharma *et al.*, 2011). It can nodulate on naturally occurring *Rhizobium* in the soil to enhance its nitrogen fixing ability whereas other legumes need crop specific inoculation. It can also be grown as a green manure crop and the foliage can be used for mulching to conserve soil moisture.

(3) Better adaptability to climate change:

The rainfall pattern of Karbi Anglong district is uneven and varies depending upon the location of hills and valleys and a considerable part of the district comes under rain shadow area. According to India Meteorological Department, for the last 50 years, the average annual rainfall of the district was little more than 1200 mm as compared to 2200-2400 mm of Assam. In addition to this, intrinsic edaphic and climatic limitations lead to low yield of some crops in the district. Thus, to make the farmers resilient to climate change in the district, pigeon pea can be grown as a potential crop as it has a good ability to withstand drought. Due to presence of its deep rooted system, it can absorb nutrients and moisture from lower layers of the soil under moisture stress condition.

(4) Host crop for lac insect:

People from the *Karbi* community use lac (locally called *Laha*) as natural dye, binding agents, polishing earthen pots and as medicine for chest and joint pains. Lac culture helps to augment a part of the household income among the villagers of Karbi Anglong district (Borah and Garkoti, 2019). Rearing of lac insect (*Kerria lacca*) is done by them twice in a year on naturally growing host plants, either in forest trees or in homegardens. As such, pigeon pea is cultivated as a host crop by the farmers in the *Jhum* lands to rear the lac insect, which has been a traditional practice since time immemorial.

(5) Potential intercrop:

Intercropping gives additional yield and income per unit area than sole cropping. Pigeonpea as an intercrop with broom grass has been proved to be suitable for degraded areas under *Jhum* cultivation. This is practiced in Borpu village under Chinthong block of West Karbi Anglong district where the farmers earn a higher benefit-cost ratio than sole cropping (Bora, 2014). However, the yield may vary from place to place depending on the cultural practices, fertility status of soil, climatic conditions etc. Besides, due its deep root system, this legume has the ability to carry nutrients from lower regions of the soil to the upper layers and thereby can benefit the main crop. Owing to its nutrient recycling property, it can be grown as a potential intercrop and for sustaining the productivity of farming systems.

(6) Medicinal properties:

Pigeon pea has many health and therapeutic benefits in addition to nutritional advantages. Different parts of the plant are used to treat diseases in humans. According to Burkill (1985), roots of pigeon pea plant are used to heal venereal diseases. Leaves are beneficial to cure diarrhea, gonorrhoea, burns, eye infections, ear ache, sore throat, sore gums, tooth ache, anaemia, intestinal worms, dizziness and epilepsy (Morton, 1976, Duke, 1981, Van der Maesen, 2006). Similarly, kidney diseases, small pox, chicken pox and measles can also be cured from leaf decoctions of the pigeon pea plant.

CONCLUSION

This article suggests that pigeon pea possesses an immense potential for expansion in Karbi Anglong district of Assam considering its nutritional properties, soil health benefits, for being a component of climate smart agriculture *etc.* The soils of this district are sandy loam to loamy which are very suitable for pigeon pea cultivation. It is considered as one of the best legumes as per its biological value. Since, it holds the key to protein supply among the pulse crops, pigeon pea should be promoted in this hill zone for betterment of the farming community. Besides, there is enormous scope in intercropping of pigeon pea with greengram or blackgram for the hill slope (20-25%) either in single or double row or broadcasting in between rows of pigeon pea for optimizing the yield. Marketing strategies should be strengthened as well. Further, its germplasm conservation, genetic improvement and introduction of new varieties should be aimed at enhancing its yield and quality to create superior genotypes with desirable traits that can combine with the soil and climatic conditions of the district.

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