Stay Green Trait in Flax: A new horizon for dual purpose flax cultivation in Assam

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Flax (*Linum usitatissimum* L.) is belongs to a member of the genus *Linum* of family Linaceae and is amongst the oldest fiber plant in the world after silk (Narayana, 1987). Various parts of the plant have been used to make fabric, dye, paper, plastic, and medicines, fishing nets, hair gels and soap. (Pandey et al. 2009). Linseed oil used for industrial purposes has approximately 50% linolenic acid. Industrial linseed oil turns rancid quickly which not suited for human consumption. New varieties of flax have been developed which contain approximately 5 percent linolenic acid. Seeds and oil with low levels of linolenic acid are suitable for human consumption. The use of flax for the production of linen goes back to at least 5,000 years. Its fibre is pale yellow in colour, soft and lustrous but less flexible and stronger than cotton. It absorbs and releases water quickly making linen comfortable to wear in hot weather. Soviet Union is the major producer of flax fibre, Belgium and adjoining countries are producing world’s best fibre. (Husain *et al.*, 2009, Pandey *et al.*, 2014)

Linseed is a shorter (<75 cm height) and multi branched oilseed crop with high seed yield but poor quality and quantity of fibre, whereas flax is tall and single stemmed with high quality and quantity of fibre and low seed yields. Edible flaxseed oil contains high levels of Omega-3 fatty acids. Omega-3 fatty acids, mostly found in fish, have been shown to decreases many risk factors for heart disease, strokes, and certain types of cancer by interfering with the effects of estrogen (Flax Council of Canada).

Currently, consumers are consuming flax seeds in their regular diets as it is having lot of health benefits and some sort flavour. The pet food and poultry industries are using flax in various feeds and rations. Poultry fed rations with flax have elevated Omega-3 fatty acid levels in egg production. As nutritional research on flax associated with the health benefits suggested to increase the usage of flax in the food and feed sectors. As happened with linseed oil, flax fiber in many products was replaced by cotton and other synthetic fibers. Currently, fabrics using cotton and linen blends are gaining popularity. Flax fiber is also being used to produce other fibrous products such as car-door panels, planting pots, and retaining mats. (Faulk *et al.*, 2002)

There are some varieties of linseed which yields both seed and fibre and are known as dual purpose linseed or flax. The linen fabric manufacturers in India import the flax fibre from European countries owing to its superior quality (Husain *et al.*, 2009, Pandey *et al.*, 2014). In order to make flax crop more economical as well as employment generating, the value addition properties of flax with respect to industrial, medicinal and textile uses. Also need to reduce the import bill by emphasizing and targeting quality fibre production. In north eastern region during winter season (rabi season) huge area of rice fallow land is found due to the unavailability of suitable remunerative crop for this particular region where ground water is available in sufficient quantity. In Assam dwarf varieties of linseed with purple colour flowers and
<75.0 cm of plant height (Tisi) is being cultivated for oilseed purpose only. So considering these above facts, there is need to introduce the dual purpose varieties of flax for both seed and fibre purpose and identification of important traits related to this dual purpose concept of flax.

In order to study the feasibility of dual purpose flax in Assam, seeds of recently released variety (JRF-2) of flax was brought from Pratapgarh (U.P.) and crop was grown during two consecutive years (2013-2014) in rabi reason at Ramie Research Station (RRS), Sorbhog at lower Assam. Flax variety JRF-2 was sown on 15th October and 20th October in year 2013 and 2014 respectively. It was observed during both the year that Seeds were matured in 145-150 days of the crop and average plant height of the crop was 135 cm. During second year (2014-15) the most interesting ‘Stay Green Trait’ was observed in more than 95% portion of stems of all the entries in All India Network Project on Jute and Allie fibre trials (IVT and AVT-1) on Flax at RRS, Sorbhog due to comparatively less temperature and higher humidity of this region. After harvesting the seeds of flax genotypes at 145-150 days, plants were sundried and subjected to the retting for 60-70 hrs (depending on the temperature and relative humidity) in the retting tank. After sun drying of the retted stems fibre was extracted, hand scutching by beating using bamboo stick or scutching machine. After beating twenty per cent fibre recovery was observed from the dried retted stem of the commercial flax variety. This extracted fibre was observed and examined by the textile expert from Mumbai and found satisfactory fibre fineness and strength. In this way this new dual purpose variety JRF-2 was found suitable for Assam condition during winter condition (rabi season) when the huge area will be fallow and available for cultivation of dual purpose flax. In general 120 days is the time of harvesting for the production of flax in Northern states including J&K and Uttrakhand because stem becomes mature and yellowish. For the cultivation of dual purpose flax (fibre) in Assam and Non-hilly areas of North East 55 kg seed/ha (higher than the normal seed rate to avoid the branching of the plants) is the optimum seed rate of the dual purpose flax. Water and nutrient requirement of dual purpose flax in Assam is 20 percent higher than the single purpose flax cultivation in other parts of country.

The identification of ‘Stay Green Trait’ in flax has opened new area of research and possibility of dual purpose flax cultivation as a remunerative and suitable option in North East particularly in Assam.

REFERENCES


Flax Stem colour at harvest in Pratapgarh (U.P.)

Stem colour at harvest in Sorbhog (Assam)

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