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Contents

From Editor's Desk	02
Agro-World News Round up	03
Neem : A Medicinal Tree	05
<i>Rajkumari and Kalpana Kulshrestha</i>	
Isabgol : A Dollar Earner	08
<i>J. Resmi</i>	
Medicinal Value of Spices	09
<i>Pratibha Singh, Poonam Tewari and Sunita Rani</i>	
Present Status and Prospects of Ginger in North East States	12
<i>V.K. Khanna, N.T. Meetei and S. Sareo</i>	
Adaptation, Use and Scientific Cultivation of Black Henbane	14
<i>M.P. Semwal, Sunita T. Pandey and V. Pratap Singh</i>	
Turmeric : A Wonderful Medicinal and Aromatic Plant	18
<i>Abhishek Pratap Singh and Manoj Kumar Roy</i>	
Kaim, <i>Mitragyna Parvifolia</i> (Roxb.) Korth : An Endangered Medicinal Tree	21
<i>Bhawna Tyagi, Vasmatkar Pashupat D., Neha Trivedi, A.K.Verma and Ashutosh Dubey</i>	
German Chamomile : A Wonderful Herbal Plant	23
<i>Kiran Kumari, Mamta Bohra and Santosh Kumar</i>	
Dietary Fibre as Diabetic Food	25
<i>Priyanka Singhal and Rita Singh Raghuvanshi</i>	
Fababean : A Potential and Beneficial Underutilized Pulse Crops	28
<i>Piyusha Singh, R. D. Singh and Madhuri Singh</i>	
Mushroom Unit for Income Generation – Success Story	30
<i>Ashish Tyagi, R.C. Verma and Rakesh Tiwari</i>	
Standards of Good Cane-Seed & Diversified Cropping System	31
<i>Pradeep Mishra Neeta Gaur and Girish Kumar</i>	
Shifting or Jhum Cultivation in North East India	32
<i>V. K. Khanna, Soringla Sareo, Donald Pakyntein and Michellyne Syiem</i>	
Increase Use Efficiency of Applied Fertilizers for Profitable Agriculture Production	35
<i>Anil Katiyar and Arjun Singh</i>	
Scientific Cultivation of Jute	38
<i>Shailesh Kumar, S.K. Jha, Shamna A. and S. Sarkar</i>	
A Critical Appraisal of the Mahatma Gandhi National Rural Employment Guarantee Programme in Kerala	40
<i>M. Esakkimuthu, C. Lawrence Prabu and S. Thirumalai Kannan</i>	
Pieris brassicae : An Emerging pest of Crucifers	43
<i>Renu Pandey, Neeta Gaur, Mona Joshi and Hemlata Martolia</i>	



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Scientific Cultivation of Jute

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Jute, an eco friendly fiber is the source of livelihood of around 40 million farmers of our country. In jute, weed management and retting is very crucial and involves around 70% total costs of cultivation. Scientific method of jute cultivation is able to give more fiber yield and higher return over Traditional methods of jute cultivation.

Jute, the golden fiber is the most important bast fibre crop of eastern and northern states of India. It is cultivated by around 40 million small and marginal farmers in about 8 lac ha. West Bengal is the leading state of the country in production and acreage of jute. Other jute growing states are Bihar, Assam, Odisha, Tripura, Meghalaya and Nagaland. Jute fibre is 100% bio-degradable and recyclable and thus environmentally friendly. It is an annually renewable resource with a high biomass production per unit land area. Jute plants help to clean the air. During growth they assimilate three times more carbon dioxide than an average tree. It is the cheapest vegetable fibre procured from the bast or skin of the plant's stem and the second most important vegetable fibre after cotton, in terms of usage, global consumption, production and availability.

It is one of the most versatile natural fibres that have been used as raw materials for packaging, textiles, non-textile, construction, and agricultural sectors. Nearly 75% of jute goods is used as packaging materials, hessian and sacks. It thrives best under warm and humid climate. Constant rain or water-logging is harmful. The neutral loamy soil having drainage facility rich in organic matter with P^H 5.5-7.5 is

considered ideal for cultivation of jute. In our country, even today, the majority of farmers grow jute in traditional way, therefore its national productivity is only up to 23 q/ha. Less profit is the most important among the factors discouraging jute cultivation. Scientific method of jute cultivation can enhance jute yield up to 35.0 q/ha ensuring higher profitability.

Field preparation:

Jute requires a clean, clod free field with fine tilth for its successful establishment. It can be accomplished by 5-6 times ploughing followed by planking. As per availability tractor drawn harrow may be employed since 2-3 times. At least one month before sowing, farm yard manure or compost @ 6.5 ton/ha should be incorporated into the soil.

Sowing time and improved varieties:

Generally sowing time of jute depends upon location of field, availability of soil moisture and distribution of rainfall (torrential rain). Seed can be sown between mid-March to last week of April. There are two types of jute available for commercial cultivation, i.e. *Chorchorus olitorius* (Tossa) and *Chorchorus capsularis* (White). Tossa jute gives higher yield in comparison to white jute and preferably grown in upland condition.

White jute is hardy in nature and can be grown in both on high and low lands. It is able to tolerate waterlogging condition to some extent. The latest varieties of Tossa jute having yield potential 35-40 q/ha are JRO 204 (Suren), JBO 2003H (Ira) and CO 58 (Saurabh). Amongst Tossa jute varieties, JBO 1 (Sudhangshu) having fine quality with low lignin content has yielded potential of 32-35q/ha.

Latest varieties of white jute having a yield potential 23-28 q/ha are JRC 698 (Shrawanti White), JRC 80 (Mitali), JRC 532 (Shashi), JRC 517 (Sidhartha) and Monalisa while JBC 5 (Arpita) has yielded potential of 28-30q/ha.

Seed treatment and method of sowing:

Before sowing of jute seed, it should be treated with Carbendazim (50WP) @ 2g/kg of seed to prevent attack of seed-borne pathogens.

Line sowing is always better than the broadcast method of sowing. Line sowing through four row seed drill requires 3.0 kg seed per hectare in comparison to 6.0-7.0 kg seed per hectare for broadcast method of sowing. Line sowing helps in the saving of manual labour required for carrying out of weeding and other inter cultural operations. A person can sow 0.8-1.0 ha land in one day through four row seed drill.

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Nutrient management:

Soil test based fertilizer application is essential for judicious use of money spent over chemical fertilizer and getting higher yield of jute. In case of limited irrigation (one) in upland condition N:P:K: @ 60:30:30 and elemental sulphur @ 30 kg/ha is applied, whereas field having two or more irrigation and lower fertility, higher dose of N:P:K: i.e. 80:40:40 kg/ha should be used. In order to enhance fertilizer use efficiency, total quantity of nitrogen should be applied in three equal proportions (at the time of sowing, 25-30 days after sowing and 40-50 days after sowing). a full dose of phosphorus and potash should be applied as basal at the time of sowing of jute.

Weed management:

Weed competition in jute is maximum up to to sixth weeks of crop stage. Generally, two manual weeding is needed to remove the weed population and thin out the extra seedlings. First weeding is carried out at 2-3 weeks after sowing while second weeding is conducted at 5-6 weeks of crop age. It costs around 30-35% of the total cost of cultivation. Pre and post-emergence herbicides are now available. These should be applied to control the weed population and reduce cost of cultivation in jute to make it more profitable. By applying herbicide saving of Rs. 10,000/ha (approx.) can be made. Generally, 500-600 liter water is needed for spray of herbicide. Application of pre-emergence herbicide Butachlor 1 kg a.i. (50 EC) @ 3 ml/l within 24-48 hours of sowing of jute, kills most of grassy and few broad leaved weeds. Broadleaved weeds including *Trainthema spp* and other common narrow leaved weeds can also be controlled by spraying Pretlachlor (50 E.C.) @ 3 ml/l at 45-48 hours after jute sowing with irrigation. Application of

post-emergence herbicide (Quizlafop ethyl @ 2-2.5 ml/l) after 15-20 days of sowing helps in management of grassy weeds. It should not be used in the field of rice, wheat, maize, bajra and jowar. on fallow land, Glyphoset (41% SL) should be applied @ 5-7 ml/l to kill established tough weeds including *Cyperus rotundus*.

Insect, pest, and disease management:

Jute is prone to infestation of major insects like yellow mite, Bihar hairy caterpillar, semilooper and jute apion at various stages of crop growth. Neem oil, available in different trade names may be safely applied @ 2ml/l (concentration 15,000 ppm) as deterrent to ward off above insects. Specific insecticide should be applied to manage population of a particular insect. Fenazaquin (10 E.C.) @ 20ml/l should be applied for management of yellow mite. Cypermethrin @100g a.i./ha or Lamdacyhalothrin (5 E.C.) @ 1.5 ml/l is most effective against the population of Bihar hairy caterpillar. Cypermethrin is also effective against infetstion of jute apion (0.03% @ 1ml/l) and jute semilooper (100g a.i./ha).

Stem and root rot caused by *Macrophomina phaseolina* is a major disease of jute. Seed treated with Carbendazim (50WP) @ 2g/kg should be sown to manage it. As a precautionary measure, Carbendazim (50WP) @ 2g/l and Copper Oxychloride (50WP) @ 4g/l should be sprayed at the interval of 15-20 days after appearance of diseased plant (2 or more/m² is the threshold limit) in the field. Above chemicals are also applied in the case of appearance of minor diseases like Hoogly wilt, anthracnose, soft rot and black band. For control of yellow mosaic (a viral disease) Imidachlorpid (17.8 S.L.) @ 2-3 ml/l should be applied. Carbosulfon (6% G) @ 18.75 g/l should be sprayed to the control root knot disease of jute.

Harvesting and retting of jute:

Generally, harvesting is done by cutting of 110-120 old jute plant close to the ground level. Harvesting including retting and fibre extraction is a labor intensive process and involves around 46 % of the total cost of cultivation. The harvested plants are tied into separate bundles and left the standing in the field for 2-3 days for the shedding of leaves. The retting process consists of bundling jute stems (18-20 cm. diameter) together and immersing them in slower moving clear water. Water rich in clay and iron should be avoided for retting process. Harvested jute bundles are placed in 2-3 layers and pressed by concrete blocks/wooden logs. Farmers should avoid the placing banana stem on the jute bundles. Placing of aquatic weeds/sunn hemp/dhaincha between these layers of jute bundles fasten the process of retting. These bundles are turned around after 5-6 days for uniform retting. The process of retting is completed around 18-21 days. In retting process, fibres in the bark get loosened, extracted from retted stalks gently, washed in water and stretched over a bamboo frame for drying in the sun. These dried fibres (TD 4-5) are further tied into bundles, stored for sale.

In case of water scarce situation, as a contingent plan jute fibres can be extracted in low volume of water through improved retting technique developed by the Central Rsearch Institute for Jute and Allied Fibres, Barrackpore, Kolkata. A special type of microbial consortium is used to fasten (10-12 days) the retting process. It gives higher fibre quality (TD 3-4) fetching more prices in comparison to the conventional method of retting.

Adoption of above scientific methods of jute cultivation will increase the present level of jute productivity and ensure higher profitability. □