

Effect of Spacing on seed yield and oil-content of *Jatropha curcas* L. under Balrampur district condition

SUBODH KUMAR SRIVASTAVA, D.S.SHUKLA AND J.P.TEWARI

Accepted : February, 2009

SUMMARY

Jatropha curcas L. is an important bio-diesel yielding crop. In the present study, different spacing treatments were applied to see the effects on the yield and oil contents of seeds. The spacing treatment of 175cm x 150 cm gave maximum seed yield per acre with maximum oil content while spacing treatment of 90cm x 90 cm. gave minimum seed yield and oil contents.

Key words : *Jatropha curcas* L., Spacing treatment, Seed yield, Oil content

Jatropha curcas L. is one of the prospective biodiesel yielding crop (Datta and Pandey, 1993) which belongs to family Euphorbiaceae. It is a multipurpose tree of significant economic importance. All parts of *Jatropha* can be used in traditional medicine (Dilara and Nath, 2000). Leaves and tender stems are used as a folk dye by tribal people (Srivastava *et al.*, 2008). In the present study, different spacing treatments were applied to see the effects on the seed yield and oil content of seeds.

MATERIALS AND METHODS

The field experiment was conducted during 2003-04 and 2004-05 at research fields of M.L.K.(P.G.) College Balrampur and various localities of Balrampur Districts. Different spacing treatments were laid out in randomized block designs with three replications.

Nursery stocks were prepared in polybags of 22.5 cm x 12.5 cm. Size. A mixture of sandy loam soil and bio compost were mixed in 1:1 ratio and filled into polybags. Seeds sowing were done in the last week of April. One to two bold and healthy seeds were sown in each polybags at the depth of 2.0- 3.0 cm and watered with rosecane to keep the soil moist.

The nursery plants were thoroughly watered to loosen the soil. Transplantation in fields were done during the rainy seasons of July- August in different block design *i.e.* 90cm x 90 cm, 110cm x 110 cm, 150 cm x 150 cm and 175 cm x 150 cm, respectively situated at different localities of Balrampur districts namely-Devtaha, Naharbalaganj, Bijlipur and Belha. The N.P.K. fertilizers were applied in

different ratio after the establishment of seedling in field. All other cultural operations such as irrigation, training and pruning, hoeing and weeding were done time to time, whenever required.

RESULTS AND DISCUSSION

The Flowering and fruiting occurred after 3rd Year of plantation under Balrampur district conditions. The data obtained in one year are given in Table 1 which indicates that plant height was significantly influenced by spacing treatment (Fig. 1). The maximum plant height (276 cm) was recorded with closest spacing (90cm x 90 cm). Unlike plant height, branches per plant were significantly improved with increase in spacing as compared to closest spacing. The wider planting at 175cm x 150 cm was found to be the most suitable for production of bold seed (648 g/ 1000 seeds), seed yield per acre (400 kg/acre), fruit length (3.66 cm) and fruit per raceme (12) in comparison to other treatments. The per cent oil content was also recorded and was found maximum (38.60%) in the spacing treatment of 175x150 cm. The results were significant

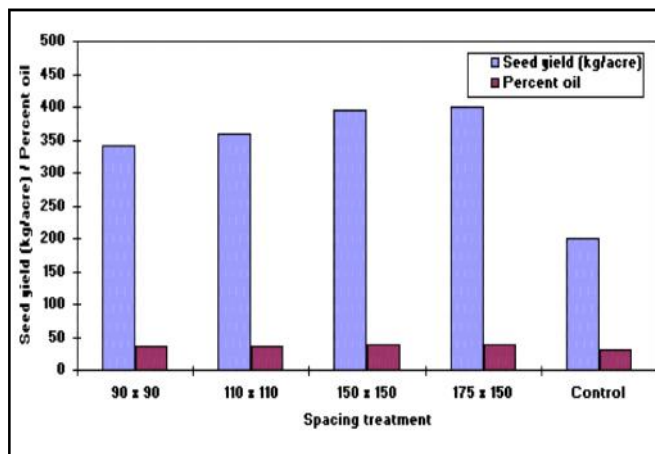


Fig. 1 : Effect of spacing on seed yield and oil content of *Jatropha curcas* L.

Correspondence to:

SUBODH KUMAR SRIVASTAVA, Department of Botany, M.L.K. (P.G.) College, BALRAMPUR (U.P.) INDIA

Authors' affiliations:

D.S. SHUKLA AND J.P. TEWARI, Department of Botany, M.L.K. (P.G.) College, BALRAMPUR (U.P.) INDIA

Table 1 : Effect of spacing on seed yield and oil content of *Jatropha curcas* L.

Spacing treatment (cm)	Plant height(cm)	Branching per plant	Weight of 1000 seeds (g)	Seed yield (kg/acre)	Fruit length (cm)	Fruit/Racemu	Per cent oil
90 x 90	267	5	600	342	3.00	7	34.82
110 x 110	250	7	600	360	3.06	9	36.32
150 x 150	242	11	640	396	3.64	12	38.30
175 x 150	240	12	648	400	3.66	12	38.60
Control	270	-	286.2	200	2.72	3	30.86
C.D. (P=0.05)	17.42	4.12		101.93	0.52	4.71	3.93

statistically. This is probably due to better geometric arrangement resulting in better absorption of moisture and nutrients and more photosynthetic process, consequently in better manifestation of yield attributes. Similar observations were also made by Sarkar and Banik (2002) in *Sesamum indicum* and Kumar *et al.* (2005) in *Cassia*

angustifolia. Jones and Miller (1992) recommended 2mx1.5m to 3mx3m spacing for *Jatropha* plantation. The present study has been made to improve the cultivation practices adopted by growers. The most suitable cultivation practice in this areas is being documented.

REFERENCES

- Datta, S.K. and Pandey, R.K. (1993). *Jatropha curcas* a promising crop for new source of fuel. *Applied Bot. Abstr.*, **17**: 108-118.
- Dilara, B. and Nath, S.C. (2000). Ethnobotanical review of medicinal plants used for skin diseases and related problems in north eastern India. *J. Herbs, species and Medicinal Plants*, **7**: 55-93.
- Jones, N. and Milter, J.H. (1992). *Jatropha curcas* a multipurpose species for problematic sites London resources series Asia technical Dept. world bank, No. 1: 40.
- Kumar D., Jha, B.K. and Ainswarth, O.P. (2005). Effect of plant population on seed yield of senna (*Cassia angustifolia*) *Internat. J. agric. Sci.*, **75** (7): 445-446.
- Sarkar R.K. and Banik, P.B. (2002). Effect of planting geometry, direction of planting and Sulphur applications on growth and productivity of sesame (*Sesamum indicum*). *Indian J. agric. Sci.*, **72** (2): 70-73.
- Srivastava, S.K., Shukla, D.S. and Tewari, J.P. (2008)- A folk dye from leaves and stem of *J.curcas* L used by Tharu tribes of Devipatan divison. *Indian J. Trad. Knowl.*(NISCAIR), **7** (1): 77-78.

