



ISSN : 2350-0743

www.ijramr.com



International Journal of Recent Advances in Multidisciplinary Research

Vol. 05, Issue 03, pp.3668-3670, March, 2018

RESEARCH ARTICLE

EVALUATION OF DIFFERNT OAT VARIETIES FOR GREEN FODDER AND SEED PRODUCTION YIELDS

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ARTICLE INFO

Article History:

Received 20th December, 2017

Received in revised form

25th January, 2018

Accepted 09th February, 2018

Published online 30th March, 2018

Keywords:

Oat, green fodder and
Seed yield.

ABSTRACT

Oats are grown for use as grain as well as forage and fodder, straw for bedding, hay, silage and chaff. The study was conducted with the objective to find out the suitable variety of oat for getting maximum fodder seed yield and fodder. A field experiment was conducted during Rabi season of '2016 to '2017 at Chiplimaf arm; Sambalpur (Odisha). The experiment consisted of three varieties of oat (Kent, JHO-822 and RO-19). The results showed that the Kent variety produced highest number of tillers/m², plant height. Green and dry (without cutting) fodder production is highest in RO-19 (51.20 cm, 265.72q/ha and 144q/ha), panicle weight and 1000 grain weight which resulted into higher seed yield (3.64 t/ha). Highest seed yield was recorded in JHO-822 (22q/ha and 10.5q/ha) than other varieties (in both cases, without green fodder cutting and with green fodder cutting) and also highest dry fodder (75q/ha) noted after one cutting of green fodder.

INTRODUCTION

India sustains about 15% of the world's livestock population and 17% of world human population from 2.3% of world geographical area and 4.2% of world's water resources (Kumari *et al.*, 2014). Livestock plays an important role in Indian economy. About 20.5 million people depend on livestock for their livelihood. Live stock contributes 16% to the income of small farm households as against an average of 14% for all rural households. Livestock provides livelihood to two-third of rural community. It also provides employment to about 8.8% of the population in India. India has vast livestock resources. Livestock sector contributes 4.11% to GDP and 25.6% of total Agriculture GDP (TAMIZHKUMRANJ 2016). Livestock Production has always been an integral part of the rural livelihood systems in Odisha, all through the known history of the state. The predominant farming system in Odisha is the mixed crop-livestock farming system and over 90 per cent of farms of all categories conform to this farming system. The livestock wealth of Odisha is impressive in number across all species, constituting a natural resource base with immense livelihood implications, even though productivity levels are very low. Livestock holding in Orissa is equitable as over 80 per cent of all livestock are owned by the marginal / small holders and the land less. Some 80 per cent of all rural households own livestock of one species or the other, or a combination of some of them, cattle being the most popular and therefore, the preponderant species. The sector has ample scope to substantially enhance the production to meet the domestic market demands, create employment and income

generating opportunities for the rural poor and enhance their food and livelihood security. Livestock sector in Odisha is confronted with different problems such as low productivity, high cost of commercial feed, low green fodder production, insufficient availability of dry fodder and low level of technology. Feed is an important component of livestock rearing, where ruminants are mostly raised with crop residues, predominantly paddy straw. However, there is increasing shortage of fodder - both dry and green. By '2025 there will be shortage of 25% of dry fodder and 65% for green fodder in India (Planning Commission of India, 2011). Odisha is one of the few states that has estimated present demand for green fodder in the State at about 312 lakh MT and that of dry fodder at 139 lakh MT and juxtaposed these figures with availability of about 161 lakh MT green fodder and 106 lakh MT dry fodder. (Dairying In Odisha- A Statistical Profile 2016). Oat is one of the important fodder crops widely grown during winter season for green fodder as well as grain purpose in different parts of the world. It ranks sixth in world cereal production following wheat, maize, rice, barley and sorghum. It is produced on 10,212 million ha. Area with an annual production of 233 million tons in the world (Anonymous, 2009). In India, cultivated fodder is limited to 4.9% of the total cropped area (Kumar *et al.*, 2012). The availability of good quality seed of forage crops in sufficient quantity is one of the major constraints, though improved varieties of various fodder crops have been evolved and the agro techniques have also been developed to obtain their high yield potential. Secondly, the forage crops are usually harvested for fodder purpose before the seed setting. Thus, the opportunity for seed production is limited. The attraction of farmers for seed production of forage crops, particularly oat can be made possible by introducing the

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varieties, which are having the potential of producing higher seed yield. Increased nutritional demand for optimal animal performance has challenged oat producers to select superior oat variety, and to combine good management practices to produce crops with high yield and favorable quality characteristics (Kim *et al.*, 2006). With the introduction of new high yielding oat varieties, the farmers have recognized oat as important fodder crop for filling the fodder gap. Many cultivars of oat have reported high feed value if cut at flowering stage i.e., the best time for the crop harvest is at 50 percent flowering stage for better yield and can meet the demand of rapidly growing livestock industry. The farmers face fodder deficiency in winter when they have only dry stalks of cereal fodder or dry summer grasses. There is a direct need to maximize fodder production per unit area which could be increased 2-3 fold by adopting improved varieties and agronomic practices (Kumar, 2014 a,b; 2013; 2012). The performance of these varieties is to be compared for their green fodder production as well as seed production. Therefore, keeping all the above facts in view, the present investigation was undertaken with the objective to identify oat varieties with superior fodder production and also seed yield for livestock production at Chiplima farm condition.

MATERIALS AND METHODS

The experiment was conducted during Rabi season of 2016-2017 at the kalyani seed production Farm Chiplima under kalynai project of BAIFF Development Research Foundation sambalpur, Odisha. Chiplima farm is located at 21°.27' North Latitude and 83°.58' East Longitude. The average elevation is 150.75 metres (494.6 ft) above mean sea level. Sambalpur falls under Zone-3 seismic number, which shows the possibility of an earthquake.. The hot season commences from the first week of March and lasts until the second half of June. In May, the temperature rises to 47 °C (117 °F). In December, the temperature comes down to 5 °C (41 °F) and gets rainfall from the south western monsoon. The most pleasant months in Chiplima farm (Sambalpur) are from October to February, during which time the humidity and heat are at their lowest. During this period, temperature during the day stays below 30 °C (86 °F) and drops to about 20 °C (68 °F) at night. The relative humidity is high during the rainy season, generally being over 75%. After the rainy season the humidity gradually decreases and the weather becomes dry towards the winter. The experiment consisted of three treatments of oat varieties namely Kent, RO-19 and JHO-822 These were laid out in randomized block design with seven replications on well prepared and leveled field.

with a row spacing of 25 cm. All the standard agronomic management practices were adopted. Growth parameters, green fodder yield and no of tillers at 50 days and dry fodder yield and seed yield of different varieties were recorded as per the standard procedure at crop maturity. The 50 % treatment wise and replication wise plot harvested at 50 day stage and data recorded for growth, tiller and green fodder production.

RESULTS AND DISCUSSION

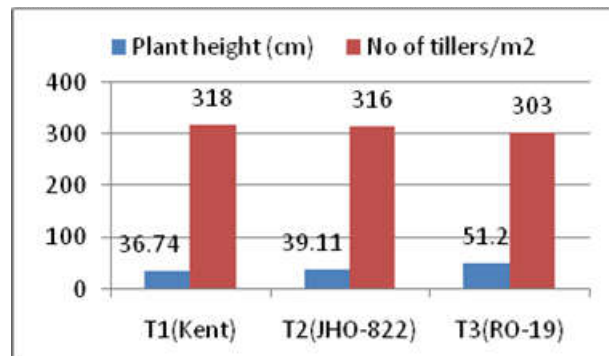


Figure. 1 Plant height and no of tillers

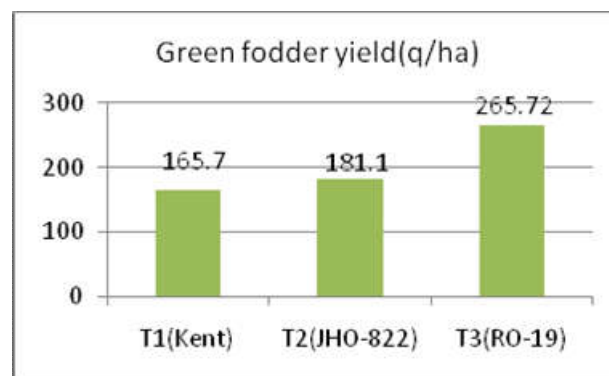


Figure. 2 Green fodder yield production

Three recommended high yielding and popular oat varieties (Kent, RO-19 and JHO-822) were Checked for there growth, no of tillers and green fodder production at 50 days of stage at Chiplimafarm condition. The highest growth of 51.20 cm and production of 265.72 qt/ha was found in T-3 (RO-19) followed by T-2 (JHO-822, 39.11cm, 181.10qt/ha) and T-3 (Kent, 36.74,165.70qt/ha).The maximum tillers were found in T-1 (318) as compared to T-2 and T-3(316 and 303).

Table-1- Seed yield and dry fodder production

Treatment	Seed yield(q/ha without green fodder harvesting)	Seed yield (q/ha)with green fodder harvesting	Dry fodder (q/ha) without green fodder harvesting	Dry fodder (q/ha) with green fodder harvesting
T1(Kent)	20	10	128	69
T2(JHO-822)	22	10.50	121	75
T3(RO-19)	13	7	144	63

All the treatments were randomly allocated to different plots in each replication with a plot size of 4.0 x 3.0 m. A uniform dose of 80 kg N/ ha and 40 kg P₂O₅/ha, 40 kg of nitrogen and phosphorous was applied as basal to all plots through urea and DAP respectively and remaining 40 kg nitrogen at tillering stage. The basal dose of fertilizers was applied in furrows nearly 2 cm below the seeds. Before sowing, the seeds were treated with bovistin at 3 g/kg of seeds. Sowing was done uniformly in all the plots manually by using 80 kg seeds/ha

The variation in various growth parameters among the varieties may be due to their genetic constitution during crop growth period. Similar patterns of growth in oat have also been reported by Kumar *et al.* (1992); Lupingan *et al.* (1999) Naeem *et al.* (2002). Ahmad *et al.* (2008). In both conditions, with fodder harvesting and without fodder harvesting, highest oat seed yield was found in JHO-822, (10.5 and 22qt/ha) as compared to kent (10 and 20 qt/ha) and RO-19(7 and 13qt/ha) 19(144qt/ha) followed by kent (128qt/ha) and JHO-

822(121qt/ha) and second seed yield data recorded with green fodder harvesting. The highest dry fodder yield with one cutting green was in T2- JHO-822(75 qt/ha) as compared to T-1, Kent (69qt/ha) and T-3 RO-19(63qt/ha). These results are in close conformity with the findings of Lupingan *et al.* (1999); Naeem *et al.* (2002) and Singh and Singh (1992).

Conclusion

It may be concluded that Oat RO-19 is the suitable variety for cultivation of green as well as dry fodder production purpose and JHO- 822 is best for green, dry fodder and seed production purpose at Chiplima farm condition in Sambalpur Odisha.

Acknowledgements

The authors are grateful for the support from the Kalynai project Odisha Farm manager Mr. Sukantjena, Assistant farm manager Mr. Shasank Singh, Agri Spervisor Mr. Tapas Kumar shahu, Account officer Mr Bipinshahu, Mr Durbadal Accountant and our Chiplima farm staffs at farm level involved in data collection.

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