

Review Article

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Effect of Various Cutting Management Schedule in Oat Crop

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ABSTRACT

Results obtained from the field experiment on oat crop indicated that highest fodder yield was recorded when crop was cut at 70 days after sowing (DAS) followed by cut at 60 DAS and least by 50 DAS. Highest grain yield was recorded when oat was cut at 60 DAS (28.06 q ha⁻¹) followed by cut at 50 DAS (25.57 q ha⁻¹) and lowest by cut at 70 DAS (23.93 q ha⁻¹). However, straw yield was recorded maximum under treatment cut at 50 DAS (65.46 q ha⁻¹) followed by at 60 (63.68 q ha⁻¹) and least at 70 (55.40 q ha⁻¹). Crude protein in fodder decreased significantly with increase in age of crop and decrease was from 13.51 per cent at cut at 50 DAS to 12.64 per cent 12.51 at cut 60 DAS and 11.77 at cut at 70 DAS. Maximum plant height was recorded when oat was cut at 70 DAS (65.9) followed by cut at 60 DAS (53.8) and then cut at 50 DAS (45.9). Highest green fodder and dry matter accumulation were recorded when oat was cut at 70 DAS (172.6 and 34.4q/ha) and least when oat was cut at 50 DAS (140.2 and 22.8q/ha). Seeds per panicle were found highest (66.0) under first cut and lowest at third cut for fodder 62.20 grains/panicle. The test weight of oat was found highest (39.23) with the 60 DAS and it was significantly higher over 50 and 70 DAS.

Keywords

Cutting management, Plant height, Test weight, Grain, Yield.

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Introduction

Forages are the main stay of animal wealth and their production is the backbone of livestock industry. The scarcity of green forages and grazing resources in the country has made the livestock to suffer continuously with malnutrition resulting in their production potentiality at sub optimum level as compared to other countries. Oat is one of the most important rabi season fodder crop in India and used both feeds and fodder. To study the effect of cutting management on growth and yield in oat, experiment was conducted at the Forage research farm of CCSHAU, Hisar during rabi 2012-13. Oat var. HJ 8 was taken as test crop. Hisar is situated in the semi-arid, sub tropics at 29°17' N latitude and 75°77' E

longitude at an altitude of 215.2 m above msl. The soil of the field is derived from Indo-Gangetic alluvium and is sandy loam in texture. Three cuttings (C₅₀ = first cut 50 DAS, C₆₀ = second cut 60 DAS and C₇₀ = third cut 70 DAS) were maintained.

Digestible dry matter was higher under single cut than in two cut system. He also stated that concentration of nitrogen was highest when no cutting was done (Deorari, 2002). Among cutting managements, except at first cut, single cut recorded maximum dry matter accumulation through leaf and stem at all stages while at first cut stage, cutting at 70 days after sowing recorded maximum

accumulation through leaf and stem. He also reported that digestible dry matter yield was higher under single cutting management than in two cutting management. However, dry matter digestibility was higher when first cut taken at 50 days after sowing and second cut at 50 percent flowering stage (Singh, 2004).

Single cut at 50% flowering recorded significantly higher dry-matter (8.05 t/ha) and digestible dry-matter yield (5.0 t/ha), dry-matter content (20.85%), acid-detergent fibre (48.14%), neutral detergent fibre (59.56%) and hemicellulose content (23.02%) than double-cutting system but total crude-protein yield (805 kg/ha), crude-protein content at both the cuts (18.70 and 10.55% respectively), digestibility (76.31%), ash (10.44%) and cell contents (56.79%) at the first cut were significantly higher when the first cut was taken at 50 days after sowing and the second cut at 50% flowering. However, at second cut, digestibility (66.72%), ash (10.34%) and cell contents (43.47%) were statistically higher when the first cut was taken at 60 days after sowing and the second cut at 50% flowering (Bhilare and Joshi, 2007).

Among cutting management practices, no cut treatment produced higher seed (2.33 t/ha) and straw (11.05 t/ha) yields than cutting at 30 and 45 DAS. However, highest green fodder yield (14.38 t/ha) was recorded with cutting at 45 DAS (Patel *et al.*, 2011). Double cut crop recorded 14.75 and 16.24% increase in green fodder yield and 3.70 and 1.36% in dry fodder yield over single cut crop during 2009-10 and 2010-11, respectively. Moreover, double cut crop recorded higher crude protein content but lower crude fibre content (Jehangir *et al.*, 2013).

The treatment combination consisting of cutting management, one at 60 days after sowing and the other at 50 per cent flowering

along with 80 kg N/ha applied 50 per cent basal and 50 per cent as top dressing after first cut recorded the highest green fodder and dry matter yield (Suhrawardy and Kalita, 2001). Increasing levels of phosphorus fertilizer application did not increase dry matter content of oat fodder significantly, however, in second cutting, a significant difference was observed in dry matter content of oat fodder (Mohiuddin, 2002). Application of Nitrogen 75kg/ha and Phosphorus 40 kg/ha+ inoculation of seed with *Azotobacter* produced highest seed and stover yield. No cut produced higher seed yield than cutting managements (Singh *et al.*, 2005).

Fertility treatments F₃ (N₇₅+ P₄₀ kg/ha+ *Azotobacter* inoculation) and F₄ (N₁₀₀+P₆₀ kg/ha) being at par produced significantly higher seed yield. No cut treatment had produced statistically higher seed yield than other cutting treatments (Karwasra *et al.*, 2007).

Among cutting managements, crop harvested once at 50 per cent flowering (C₁) significantly improved leaf area index, specific leaf weight and also the dry matter yield. Leaf area index significantly increased with increase in nitrogen levels up to 160 kg ha⁻¹ and dry matter yield up to 120 kg N ha⁻¹ (Bhilare, 2009).

Application of 25% higher dose of N & P fertilizers than the recommended gives significantly higher seed yield. Likewise one cutting at 60 days after sowing, lodging could be reduced significantly whereas maximum seed yield was obtained with OS 6 as it showed maximum response to cutting and fertilizer management practices (Kumar and Dudi, 2010). Crude protein content increased with increase in fertility level up to 150 kg N + 70 kg P₂O₅ + 40 kg K₂O ha⁻¹. Double cut crop gave higher forage yield and better quality traits as compared to single cut crop

(Jehangir *et al.*, 2012). Increasing trend was found in dry matter accumulation and leaf area index of oats with the advancement of growth of the crop up to 60 days when 1st cutting was taken. A significant response from cutting and fertilizer management was found on total green and dry fodder yields of oats. The highest green and dry fodder yields were achieved from fertilizer schedule of N₁₂₀, P₆₀, K₆₀ kg ha⁻¹ both at single cutting and two cuttings management. Significantly higher total green and dry fodder yields were obtained from two cut management (29.74 and 7.92 t ha⁻¹, green and dry fodder respectively) when compared with single cut management (14.68 and 3.37 t ha⁻¹, respectively), indicating the scope of getting two cuttings from fodder oats in red and lateritic belt of West Bengal (Hedayetullah and Barik, 2012).

The highest green forage yield, crude protein yield, and neutral detergent fibre yield were obtained with the application of N in 3 splits (1/2 of the total rate as basal + 1/4 of the total rate at 20 DAS + 1/4 of the total rate at 40 DAS) along with the application of K in 2 splits (1/2 of the total rate as basal + 1/2 of the total rate at 20 DAS) under double cutting (Alipatra *et al.*, 2013).

The genotype JHO 99-2 recorded significantly higher green forage (37.71 t ha⁻¹) and dry matter yield (7.45 t ha⁻¹) compared to JHO 822 and Kent. The nitrogen level of 150 kg N ha⁻¹ produced significantly higher green forage (39.41 t ha⁻¹) and dry matter yield (7.79 t ha⁻¹) compared to 120 and 90 kg N ha⁻¹. Harvesting of fodder at 65 DAS recorded significantly higher green forage (35.39 t ha⁻¹) and dry matter yield (7.19 t ha⁻¹) compared to 55 DAS. In interaction significantly higher green forage (46.92 t ha⁻¹) and dry matter yield (8.64 t ha⁻¹) was obtained with genotype JHO 99-2 with 150 kg N ha⁻¹ with cutting interval of 65 DAS (Patel and

Alagundagi, 2013). Based on finding it may be concluded that for taking fodder from first cut and grain from second cut, oats should be harvested for fodder at 60 days after sowing and then left for grain production. This practice provides good quality green fodder and maximum net returns.

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