

OS 377—A NEW FORAGE SINGLE-CUT OAT VARIETY FOR THE CENTRAL ZONE OF INDIA

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SUMMARY

An improved single-cut oat variety, OS 377, was developed under AICRP (Forage Crops & Utilization) and released and notified for cultivation under timely sown, normal fertility and irrigated conditions in the Central Zone of India comprising states of Madhya Pradesh, Maharashtra, Gujarat, Uttar Pradesh and Chhatisgarh. The new variety OS 377 was developed at Forage Research Section, Department of Genetics & Plant Breeding, CCS Haryana Agricultural University, Hisar by pedigree method of breeding from a cross between HJ 8 x Kent. This variety gave 13.6 per cent more green fodder yield (537.1 q/ha) and about 12 per cent more dry matter yield (121.7 q/ha) than the best check JHO 822 (472.6 q/ha GFY and 108.6 q/ha DMY) in all India Coordinated Breeding Varietal Evaluation Trials (average of three years over different locations) for Central Zone of the country.

Key words : Single-cut oat variety, OS 377, green fodder yield, dry matter yield

The livestock sector in India alone contributes nearly 25.6 per cent of value of output at current prices of total value of output in agriculture, fishing and forestry sector. India with 2.3 per cent share of global geographical area supports nearly 20 per cent of the livestock population of the world, notably among them are cattle (16%), buffalo (55%), goat (20%) and sheep (5%). The desired annual growth of agriculture sector @ 4 per cent can also be accomplished by enhancing productivity from the livestock sector. This would require a steady supply of fodder for supporting the livestock population. Having only 4 per cent of total cropping area under fodder cultivation has resulted in a severe deficit of green fodder (36%), dry fodder (40%) and concentrates (57%). The need of the hour is, therefore, to fulfil this shortfall in demand for fodder (which is over 55%).

The single most important constraint in the fodder production and productivity is the non-availability of quality improved varieties of forage crops to the farmers. The supply of nutritious fodder is a pre-requisite for the success of dairy industry. Oat is a nutritive forage,

palatable having good regeneration capability with high dry matter production (Kumar *et al.*, 2010). As area for fodder production is decreasing continuously, therefore, for higher fodder production, there is only way to develop the high yielding varieties of fodder crops.

The improved single-cut oat variety, OS 377, was developed under AICRP (Forage Crops & Utilization) and released and notified vide Gazette Notification of GOI, New Delhi, Ministry of Agriculture, Department of Agriculture & Cooperation, Government of India, S.O. 268(E), 28.1.2015 for cultivation under timely sown, normal fertility and irrigated conditions in the Central Zone of India comprising states of Madhya Pradesh, Maharashtra, Gujarat, Uttar Pradesh and Chhatisgarh. The new variety was registered with NBPGR having IC No. 599579. The new variety OS 377 was developed at Forage Research Section, Department of Genetics & Plant Breeding, CCS Haryana Agricultural University, Hisar by pedigree method of breeding from a cross between HJ 8 x Kent. This variety gave about 13.6 per cent more green fodder yield (537.1 q/ha) and 12.1 per cent more dry matter yield (121.7 q/

ha) than the best check JHO 822 (472.6 q/ha GFY and 108.6 q/ha DMY) in all India Coordinated Breeding Varietal Evaluation Trials for Central Zone. The results are presented in Table 1. This variety gave higher per day productivity of GFY (6.0 q/ha/day = 5.4%) and DMY (1.38 q/ha/day = 6.2%) as compared to the best check JHO 822 (5.7 q/ha/day GFY and 1.30 q/ha/day DMY). This variety is tall (122.3 cm), having good leaf : stem ratio (0.65) and is bold seeded, suitable for single-cut system.

In agronomic trials, the new variety OS 377 (522.1 q/ha) showed its superiority in green fodder production over both the national checks OS 6 (471.7.1 q/ha) and Kent (476.9 q/ha) and zonal check JHO 822 (479.6 q/ha), whereas for DMY it was almost at par with the national checks (Table 2). The variety responded up to 120 kg N/ha for GFY and DMY at Jhansi and Jabalpur. At Jhansi and Jabalpur, the highest GFY and DMY were recorded by the new variety OS 377 (Table 2). The improved variety OS 377 is highly resistant to *Helminthosporium* leaf blight under field conditions. The new improved variety OS 377 is superior to both the national checks OS 6 and Kent and the zonal check JHO 822 in fodder yield and nutritional quality (Table 3), thus its release would auger in enhancing the quality fodder production in

the Central Zone. The variety is also having good digestibility as is evident by IVDMD (59.0%) in Table 4. Sheoran *et al.* (2008) reported that increasing rates of nitrogen application up to 120 kg N/ha significantly enhanced the forage yield, crude protein and other ancillary characters over the lower doses of nitrogen at all the locations of experimentation. Kundu *et al.* (2015) reported that increasing nitrogen levels increased plant height, plant population, dry matter yield and green fodder yield. As nitrogen is the main component of plant growth and development and also increases protein content. Singh *et al.* (2015) reported that the plant height and protein content in maize also increased with increasing N levels.

CONCLUSION

The new variety OS 377 exhibited 11.8 per cent superiority over the best check Kent for GFY and 10.6 per cent over best check OS 6 for DMY. The new variety OS 377 also showed superiority over the zonal check JHO 822 by 13.6 per cent for GFY and 12.1 per cent for DMY. The new variety will be helpful in increasing the production and productivity of oats growers of Central Zone of India comprising states of Madhya Pradesh, Maharashtra, Gujarat, Uttar Pradesh and Chhatisgarh.

TABLE 1
Green fodder and dry matter yield (q/ha) : Mean performance of OS 377 in the Central Zone over three years

Year	No. of locations	Mean performance of variety OS 377	National check		Zonal check (Central zone)		Qualifying varieties				
			Kent	OS 6	JHO 822	JO 03-99	JHO 2010-1	JO 03-97	UPO 10-2	SKO 188	UPO 10-1
Green fodder yield (q/ha)											
2010-11 (IVTO, SC)	8	550.9	481.4✓	463.3	459.2	519.2✓	515.7	511.4	510.6	510.2	508.1
2011-12 (AVTO, SC-1)	8	553.2	482.1✓	471.5	453.0	538.7✓	483.5	507.5	535.5	450.7	479.8
2012-13 (AVTO, SC-2)	8	507.1	478.0	504.2	505.7✓	505.5	519.2	505.5	527.7✓	445.4	505.2
Mean		537.1	480.5✓	479.7	472.6	521.1	506.1	508.1	524.6✓	468.8	497.7
Overall per cent superiority			11.8	12.0	13.6	3.1	6.1	5.7	2.4	14.6	7.9
Dry matter yield (q/ha)											
2010-11 (IVTO, SC)	8	119.8	108.7	109.4✓	108.8	116.3	123.7	108.7	118.4	124.9✓	118.2
2011-12 (AVTO, SC-1)	8	130.2	101.8	104.5✓	101.6	124.4	110.6	124.0	125.5✓	114.1	112.1
2012-13 (AVTO, SC-2)	8	115.1	106.5	116.0✓	115.3	115.3	121.7✓	118.5	117.5	105.6	116.0
Mean		121.7	105.7	110.0✓	108.6	118.7	118.7	117.1	120.5✓	114.9	115.4
Overall per cent superiority			15.1	10.6	12.1	2.5	2.5	3.9	1.0	5.9	5.5

IVTO (SC) : Initial varietal trial in oats (Single cut), AVTO (SC-1) : First advanced varietal trial in oats (Single cut) AVTO (SC-2) : Second advanced varietal trial in oats (Single cut).

Locations : 8 (Jhansi, Rahuri, Urulikanchan, Kanpur, Anand, Jabalpur, Raipur and Karjat).

TABLE 2
Effect of nitrogen levels on green fodder and dry matter yield (q/ha) on OS 377

Treatment	Jhansi	Jabalpur	Mean	Jhansi	Jabalpur	Mean
	Green fodder yield (q/ha)			Dry matter yield (q/ha)		
A. Entry						
JO-03-97	546.5	431.8	489.2	87.5	90.2	88.9
JO-03-99	626.5	433.6	530.1	98.9	88.9	93.9
SKO-170	561.3	390.1	475.7	85.8	77.4	81.6
SKO-188	685.8	387.9	536.9	89.3	77.8	83.6
OS-377	688.7	355.4	522.1	98.5	69.7	84.1
UPO-10-1	626.5	379.9	503.2	93.1	78.8	86.0
JHO-10-2	577.6	368.3	473.0	91.6	72.6	82.1
JHO-10-1	627.9	359.9	493.9	92.9	71.9	82.4
UPO-10-2	559.9	295.4	427.7	87.0	58.6	72.8
JHO-822 (ZC)	571.7	387.4	479.6	94.0	77.0	85.5
OS-6 (NC)	555.4	387.9	471.7	92.9	78.5	85.7
Kent (NC)	580.6	373.2	476.9	98.0	74.6	86.3
S. Em±	18.6	20.6		6.1	7.3	
C. D. (P=0.05)	54.6	60.6		NS	21.6	
B. Nitrogen level (kg/ha)						
40	566.1	316.3	441.2	86.3	60.7	73.5
80	603.9	396.5	500.2	92.2	81.2	86.7
120	632.1	424.9	528.5	98.9	87.1	93.0
S. Em±	8.7	12.3		1.8	6.3	
C. D. (P=0.05)	24.8	36.5		5.1	18.2	
C. Interaction: Entry X N levels						
S. Em±	30.2	16.5		6.2	6.2	
C. D. (P=0.05)	NS	48.6		17.6	18.5	
C. V. (%)	8.7	15.1		11.6	10.3	

NS—Not Significant.

TABLE 3
Crude protein yield (q/ha) in OS 377

Year	Locations	Variety OS 377	National check		Zonal check	Qualifying varieties					
			Kent	OS 6	JHO 822	JO 03-99	JHO 2010-1	JO 03-97	UPO 10-2	SKO 188	UPO 10-1
2010-11 (IVTO, SC)	5	9.22	8.30	7.14	7.44	10.04	8.86	7.82	9.80	9.66	8.52
2011-12 (AVTO, SC-1)	5	7.94	8.24	9.32	8.30	9.70	8.82	9.62	8.84	8.82	8.78
2012-13 (AVTO, SC-2)	5	7.84	7.05	9.42	7.66	8.47	7.96	8.03	8.40	6.61	7.79
Mean		8.33	7.86	8.63	7.80	9.40	8.55	8.49	9.01	8.36	8.36
Overall % superiority			6.0	(-3.5	6.8	(-11.4	(-2.6	(-1.9	(-7.5	(-1.0	(-1.0

Locations : Urulikanchan, Anand, Jabalpur, Raipur and Rahuri.

TABLE 4
IVDMD (%) in OS 377

Year	Locations	Variety OS 377	National check		Zonal check	Qualifying varieties					
			Kent	OS 6	JHO 822	JO	JHO	JO	UPO	SKO	UPO
						03-99	2010-1	03-97	10-2	188	10-1
2012-13 (AVTO, SC-2)	1	59.0	53.2	57.6	55.6	57.2	51.3	51.5	55.7	52.9	55.7

Location : Rahuri.

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