Forage Res., **41** (1) : pp. 59-62 (2015) **http://forageresearch.in**
SHORT COMMUNICATION

OS 346–A NEW FORAGE SINGLE-CUT OAT VARIETY UNDER TIMELY SOWN, NORMAL FERTILITY AND IRRIGATED CONDITIONS IN THE CENTRAL ZONE OF INDIA

R. N. ARORA*, B. S. JHORAR, C. KISHOR, R. S. SHEORAN, A. S. RATHI, P. P. GUPTA AND U. N. JOSHI

Department of Genetics & Plant Breeding
CCS Haryana Agricultural University,
Hisar-125 004 (Haryana), India
**(e-mail : arora15@rediffmail.com)*
(Received : 12 September 2014; Accepted : 30 January 2015)

SUMMARY

An improved single-cut oat variety, OS 346, was developed under AICRP (Forage Crops) 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 346 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 OS 6 x Kent. This variety gave about 11.0 per cent more green fodder yield (534.7 q/ha) and 13.3 per cent more dry matter yield (110.8 q/ha) than the best check JHO 822 (481.6 q/ha GFY and 97.8 q/ha DMY) in all India Coordinated Breeding Varietal Evaluation Trials for Central Zone.

Key words : Single-cut oat variety, OS 346, green fodder yield, dry matter yield

India has the largest population of animals which accounts for about 17 per cent of the world livestock population. The availability of nutritive fodder is inadequate in the country. 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). For fodder production, area 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 346, was developed under AICRP (Forage Crops) and released and notified vide SO 733(E), 01-04-2010 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. 574584. The new variety OS 346 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 OS 6 x Kent. This variety gave about 11.0 per cent more green fodder yield (534.7 q/ha) and 13.3 per cent more dry matter yield (110.8 q/ha) than the best check JHO 822 (481.6 q/ha GFY and 97.8 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 (6.5 q/ha/day=3.2%) and DMY (1.23 q/ha/day=10.8%) as compared to the best check JHO 822 (6.3 q/ha/day GFY and 1.11 q/ha/day DMY) as given in Table 2. This variety is tall (124 cm), having leaf : stem ratio bold seeded, suitable for single-cut system.

In agronomic trials, the new variety OS 346 showed its superiority in green fodder production over both the national checks OS 6 and Kent, whereas for DMY it was superior to the national check Kent only (Table 3). The variety responded significantly up to 80 kg N/ha for GFY at Raipur and for DMY at Jhansi, whereas at Jabalpur and Raipur the similar response was observed up to 120 kg N/ha. At Jhansi and Raipur

TABLE 1
Mean performance in green fodder yield (q/ha) and dry matter yield (q/ha) in the Central Zone

Year	No. of locations	Mean performance of proposed variety OS 346	National check		Zonal check (Central Zone)	Qualifying varieties	
			Kent	OS 6	JHO 822	JO 03-91	UPO 06-1
Green fodder yield (q/ha)							
2006-07 (IVTO, SC)	6	511.3	457.7	458.0	458.9√	508.1	490.8
2007-08 (AVTO, SC-1)	6	651.3	544.7	511.3	553.9√	627.7	623.1
2008-09 (AVTO, SC-2)	6	441.4	409.0	438.4√	431.9	481.0	468.2
Mean		534.7	470.5	469.2	481.6	538.9	527.4
Overall % superiority over best check	18	11.0	-	-	-	11.9	9.5
Dry matter yield (q/ha)							
2006-07 (IVTO, SC)	6	121.3	98.1	101.9√	96.9	111.1	108.0
2007-08 (AVTO, SC-1)	5	120.9	97.3	89.0	104.4√	122.4	130.0
2008-09 (AVTO, SC-2)	6	90.1	86.6	90.4	92.2√	100.6	99.3
Mean	17	110.8	94.0	93.8	97.8√	111.4	112.4
Overall % superiority over best check		13.3	-	-	-	13.9	14.9

√Indicates the best check. Locations : 6 (Jabalpur, Jhansi, Rahuri, Urulikanchan, Kanpur and Anand).
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).

TABLE 2
Effect of nitrogen levels on green fodder yield (q/ha) of new variety OS 346 vis-à-vis checks and qualifying varieties of oats during 2008-09 in the Central Zone

Treatment	Jabalpur	Rahuri	Jhansi	Raipur	Mean
Entries					
JO 03-91	503.9	276.9	434.6	265.3	370.2
OS 346	398.7	306.3	461.6	311.5	369.5
UPO 06-1	467.7	339.4	335.4	138.7	320.3
UPO 06-2	468.3	303.0	322.0	-	364.4
Kent (NC)	396.9	272.9	425.0	247.4	335.6
OS 6 (NC)	-	-	439.1	277.4	358.3
S. Em±	8.8	11.0	9.7	1.46	-
C. D. (P=0.05)	28.6	36.0	28.5	4.2	-
Nitrogen levels (kg/ha)					
0	366.5	293.9	378.8	101.9	285.3
40	417.5	315.2	394.9	270.4	349.5
80	485.5	346.8	422.2	303.0	389.4
120	518.8	325.1	415.9	316.9	394.2
S. Em±	4.4	6.2	10.2	1.3	-
C. D. (P=0.05)	12.6	17.9	30.0	3.7	-
Interaction (Entries x N levels)					
S. Em±	9.8	13.9	11.5	2.9	-
C. D. (P=0.05)	28.2	NS	33.8	8.4	-
C. V. (%)	17.6	-	9.2	3.0	-

NS–Not Significant.

TABLE 3
Effect of nitrogen levels on dry matter yield (q/ha) of proposed variety OS 346 vis-à-vis checks and qualifying varieties of oats during 2008-09

Treatment	Dry matter yield (q/ha)					Crude protein yield (q/ha)			
	Jabalpur	Rahuri	Jhansi	Raipur	Mean	Jabalpur	Rahuri	Jhansi	Mean
Entries									
JO 03-91	121.1	91.3	96.6	83.5	98.1	9.6	6.5	9.3	8.5
OS 346	94.1	76.8	102.6	92.8	91.6	7.2	5.7	10.3	7.7
UPO 06-1	110.8	67.5	74.5	52.9	76.4	8.9	5.1	7.6	7.2
UPO 06-2	110.3	83.3	71.5	-	88.4	8.6	6.6	7.0	7.4
Kent (NC)	93.4	71.2	94.4	81.4	85.1	7.3	5.2	9.3	7.3
OS 6 (NC)	-	-	99.5	89.2	94.4	-	-	9.5	9.5
S. Em±	1.8	2.8	1.8	1.4	-	0.2	0.2	0.3	-
C. D. (P=0.05)	5.9	9.3	5.3	2.8	-	0.5	0.7	0.9	-
Nitrogen levels (kg/ha)									
0	85.1	65.0	84.8	54.2	72.3	6.4	4.4	8.3	6.4
40	98.0	76.1	87.8	70.4	83.1	7.6	5.5	8.6	7.2
80	115.9	89.3	93.2	89.5	97.0	9.2	6.7	8.9	8.3
120	124.8	81.6	94.6	105.7	101.7	10.0	6.6	9.5	8.7
S. Em±	1.08	2.1	1.4	1.3	-	0.1	0.2	0.2	-
C. D. (P=0.05)	3.11	6.1	4.1	2.5	-	0.3	0.5	0.6	-
Interaction (Entries x N levels)									
S. Em±	2.41	4.8	2.2	2.8	-	0.2	0.4	0.4	-
C. D. (P=0.05)	6.9	NS	6.5	5.7	-	0.6	NS	1.2	-
C. V. (%)	19.1	-	6.8	4.2	-	11.4	-	5.9	-

NS–Not Significant.

TABLE 4
Effect of nitrogen levels on plant height (cm) and leaf : stem ratio of proposed variety OS 346 vis-à-vis checks and qualifying varieties of oats during 2008-09 in the Central Zone

Treatment	Plant height (cm)					Leaf : stem ratio			
	Jabalpur	Rahuri	Jhansi	Raipur	Mean	Rahuri	Jhansi	Raipur	Mean
JO 03-91	138.6	107.8	129.2	105.6	120.3	0.65	0.62	0.47	0.58
OS 346	133.1	121.6	120.0	121.9	124.2	0.70	0.54	0.66	0.63
UPO 06-1	143.3	104.9	118.7	100.9	117.0	0.72	0.55	0.44	0.57
UPO 06-2	130.4	127.3	121.0	-	126.2	0.74	0.51	-	0.63
Kent (NC)	126.3	107.1	124.5	107.9	116.5	0.67	0.59	0.47	0.58
OS 6 (NC)	-	-	120.7	112.7	116.7	-	0.52	0.60	0.56
S. Em±	0.3	3.7	3.9	1.8	-	0.04	0.02	0.01	-
C. D. (P=0.05)	1.1	12.2	NS	3.6	-	NS	0.06	0.02	-
Nitrogen levels (kg/ha)									
0	125.0	107.0	119.2	89.5	110.2	0.63	0.50	0.39	0.51
40	132.6	113.3	124.8	106.5	119.3	0.66	0.61	0.43	0.57
80	137.5	116.7	125.6	118.2	124.5	0.69	0.63	0.46	0.59
120	142.2	118.0	126.7	124.9	128.0	0.81	0.64	0.53	0.66
S. Em±	0.5	1.9	3.6	1.6	-	0.04	0.02	0.01	-
C. D. (P=0.05)	1.6	5.5	NS	3.2	-	0.12	0.06	0.02	-
Interaction (Entries x N levels)									
S. Em±	1.2	4.3	-	3.2	-	0.09	-	0.02	-
C. D. (P=0.05)	3.5	NS	-	7.2	-	NS	-	0.04	-
C. V. (%)	7.0		6.7	-	-		5.2	6.0	-

NS–Not Significant.

locations, the highest GFY and DMY were recorded by the new variety OS 346 (Table 3).

The improved variety OS 346 was found better in protein yield (q/ha), plant height and leaf : stem ratio as well (Table 4). The new variety is highly resistant to *Helminthosporium* leaf blight and better in nutritional quality (Table 5). The new improved variety OS 346 is superior to both the national checks OS 6 and Kent and the zonal check JHO 822 in fodder yield and nutritional quality, thus its release would auger in enhancing the quality fodder production in the Central Zone. 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. As nitrogen is the main component of plant growth and development and also increases protein content.

TABLE 5
Crude protein yield (q/ha) and IVDMD (%)

Year	No. of locations	Mean performance of proposed variety OS 346	National check		Zonal check (Central zone)	Qualifying varieties	
			Kent	OS 6	JHO 822	JO 03-91	UPO 06-1
Crude protein yield (q/ha)							
2006-07 (IVTO, SC)	4	10.43	8.20	7.58	8.30√	8.70	8.90
2007-08 (AVTO, SC-1)	3	9.07	7.57	6.97	7.67√	8.40	10.23
2008-09 (AVTO, SC-2)	4	6.88	6.58	7.70	6.70√	8.43	8.25
Mean		8.79	7.45	7.42	7.56√	8.51	9.13
Overall % superiority over best check		16.3	-	-	-	12.6	20.8
IVDMD (%)							
2008-09 (AVTO, SC-2)		66.2	66.1	63.0	65.4	60.0	64.7

√indicates the best check.

CONCLUSION

The new variety OS 346 exhibited superiority over the best check (OS-6) and the qualifying variety UPO 06-1. The new variety OS 346 showed superiority over the best check; however, qualifying varieties showed little more superiority. The new variety OS 346 showed superiority over the best check JHO 822 and the qualifying variety JO 03-91. The new variety OS 346 showed superiority over the best check and both the qualifying varieties.

REFERENCES

Kumar, A., R. K. Arya, and S. K. Pahuja. 2010 : Effect of cutting and fertilizer management on seed quality parameters of oat (*Avena sativa* L.). *Forage Res.*, **35** : 198-200.

Sheoran, R. S., N. S. Yadav, U. S. Tiwana, and U. N. Joshi. 2008 : Multi-locational evaluation of promising oat (*Avena sativa* L.) varieties for forage yield and quality under varying nitrogen levels. *Forage Res.*, **34** : 90-93.