

HFO 607: A NEW SINGLE-CUT OAT VARIETY FOR NORTH WEST ZONE OF INDIA

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(Received : 15 March 2021; Accepted : 30 March 2021)

SUMMARY

The new single-cut oat variety, HFO 607, was developed by Forage Section, Department of Genetics and Plant Breeding, CCS Haryana Agricultural University, Hisar. It was released and notified for cultivation under timely sown, normal fertility and irrigated conditions in North West Zone of India (Rajasthan, Punjab, Haryana, Terai region of Uttarakhand and Western Uttar Pradesh). It was developed through pedigree method of breeding. This variety gave 615.7 q/ha green fodder yield in North West Zone which was 11.9% and 17.4 % higher than the national checks Kent and OS 6, respectively. It also showed superiority of 8.8% for green fodder yield than the zonal check OL 125 (NWZ) (average of three years over different locations) in North West Zone of the country.

Key words : oat, crude protein, dry matter, green fodder, quality, variety

The growing livestock population in India demands for a continuous supply of nutritious quality fodder. Oat (*Avena sativa* L.) is one of the most important cereal fodder crops grown in India during *Rabi* season (Kumar *et al.*, 2010). It is a fast growing palatable crop which produces significant amount of fresh fodder within short period (60–70 days) with adequate nutritional value (Bilal *et al.*, 2017). It provides soft and palatable fodder rich in crude protein (10–12%) and protein content of the hull-less oat kernel (groat) ranges from 12–24%, the highest among cereals (Lasztity, 1999). It also contains 20% dry matter, 10% crude protein, 91% organic matter (DM basis) (Gupta *et al.*, 2004). It is chiefly fed as green fodder, however during fodder scarcity, excessive is changed to hay or silage for animal feeding. As the pressure is increasing on the cultivable land at a high rate, it becomes important for the plant breeders to develop fodder varieties with high production potential and quality (Singh *et al.*, 2002).

The single-cut oat variety, 'HFO 607' was developed by Forage Section, Department of Genetics and Plant Breeding, CCS Haryana Agricultural University, Hisar under AICRP on FCU. It was released by the Central Sub-committee on Crop Standards, Notification and Release of Varieties for Agricultural Crops & notified by Ministry of Agriculture & Farmers Welfare, (Deptt. of Agriculture, Co-operation and

Farmer's welfare) vide notification number **S.O. 500 (E), dated 29.01.2021** for cultivation under timely sown, normal fertility and irrigated conditions in the North West Zone (Rajasthan, Haryana, Punjab, Terai region of Uttarakhand and Western Uttar Pradesh) of India during *Rabi* season. This variety has been registered with NBPGR having national identity number IC 633881. It was developed through pedigree method.

The variety HFO 607 gave 615.7 q/ha green fodder yield which is 11.9% and 17.4% more than the national checks Kent (549.4 q/ha) and OS 6 (531.5 q/ha), respectively. It showed superiority of 8.8% for green fodder yield than the North West Zone check OL 125 (565.3 q/ha) (Table 1). In the case of dry matter yield, the variety HFO 607 (131.2 q/ha) out yielded the best national checks Kent (115.9q/ha) by 12.98% and OS 6 (106.7 q/ha) by 23.93%. It showed superiority of 21.77% for dry matter yield than the North West Zone check OL 125 (107.9 q/ha) (Table 2). It also gave 7.48 % higher per day productivity of GFY over best national check Kent. While it gave 15.18% higher GFY per day productivity over the North West Zone check OL 125 (Table 3). This variety also showed superiority for higher per day productivity of DMY over the national checks Kent (7.7 %), OS 6 (17.2 %), North West Zone check OL 125(17.2%) and 2.7 % over the best qualifying variety OL1861

TABLE 1
Green Forage yield (q/ha): Mean performance (over three years) of HFO 607 in North West Zone of India

Year	Trial Name	No. of locations	Variety HFO 607	National check		NWZ	Qualifying Varieties				
				Kent	OS 6	check OL-125	OL 1869-1	OL - 1861	JO-05 -7	OL-1862	SKO-229
2016-17	IVTO-SC	7	543.6	493.2*	422.7	497.1	541.5	531.7	542.1	476.9	482.3
2017-18	AVTO-1-SC	5	596.1	541.2*	515.8	583.1	574.0	581.3	529.2	525.2	493.9
2018-19	AVTO-2-SC	5	707.4	613.7	655.9*	615.7	758.1	775.9	646.8	726.3	662.5
Weighted Mean			615.7	549.4*	531.5	565.3	624.8	629.6*	572.7	576.13	546.3
% superiority											
2016-17				10.21	28.63	9.35	0.40	2.23	0.27	13.98	12.70
2017-18				10.14	15.56	2.22	3.85	2.54	12.64	13.49	20.69
2018-19				15.26	7.85	14.97	-7.16	-9.68	9.36	2.67	6.77
% superiority				11.9	17.4	8.8	-0.97	-1.6	7.4	10.1	13.4

*=Indicates the best check/best qualifying variety, IVTO-SC: Initial Varietal Trial in Oats (single cut), AVTO-1-SC: First Advanced Varietal Trials in oats (single cut), AVTO-2-SC: Second Advanced Varietal Trials in oats (single cut)

TABLE 2
Dry Matter yield (q/ha): Mean performance (over three years) of HFO 607 in North West Zone of India

Year	Trial Name	No. of locations	Variety HFO 607	National check		NWZ	Qualifying Varieties				
				Kent	OS 6	check OL-125	OL 1869-1	OL - 1861	JO-05 -7	OL-1862	SKO-229
2016-17	IVTO-SC	4	121.5	113.4*	93.1	114.5	110.8	104.6	117.6*	102.5	99.7
2017-18	AVTO-1-SC	4	118.1	104.7*	94.6	101.1	103.1	107.0*	95.7	93.9	90.3
2018-19	AVTO-2-SC	4	154.1	129.5	132.3*	108.2	156.4	166.4*	143.1	152.0	136.9
Weighted Mean			131.2	115.9*	106.7	107.9	123.4	126.0*	118.8	116.1	109.0
% superiority											
2016-17				7.14	30.5	6.11	9.65	16.1	3.31	18.5	21.9
2017-18				12.8	24.8	16.8	14.5	10.4	23.4	25.8	30.8
2018-19				19.0	16.5	42.4	-1.47	-7.39	7.69	1.38	12.6
% superiority				12.98	23.93	21.77	7.56	6.37	11.47	15.22	21.76

*=Indicates the best check/best qualifying variety, IVTO-SC: Initial Varietal Trial in Oats (single cut), AVTO-1-SC: First Advanced Varietal Trials in oats (single cut), AVTO-2-SC: Second Advanced Varietal Trials in oats (single cut)

TABLE 3
Per day productivity of GFY (q/ha/day): Mean performance (over three years) of HFO 607 in North West Zone of India

Year	Trial Name	No. of locations	Variety HFO 607	National check		NWZ	Qualifying Varieties				
				Kent	OS 6	check OL-125	OL 1869-1	OL - 1861	JO-05 -7	OL-1862	SKO-229
2016-17	IVTO-SC	3	5.41	4.91*	4.28	5.39	5.11	4.83	5.2*	4.89	4.67
2017-18	AVTO-1-SC	4	4.98	4.69*	4.41	3.93	4.88	5.04*	4.52	4.50	3.78
2018-19	AVTO-2-SC	4	5.99	5.63*	5.44	4.92	6.57*	6.42	5.73	6.12	5.66
Weighted Mean			5.46	5.08*	4.71	4.74	5.45	5.43	5.15	5.17	4.70
% superiority				7.48*	15.92	15.18	At par	At par	6.01	5.61	16.17

*=Indicates the best check/best qualifying variety, IVTO-SC: Initial Varietal Trial in Oats (single cut), AVTO-1-SC: First Advanced Varietal Trials in oats (single cut), AVTO-2-SC: Second Advanced Varietal Trials in oats (single cut)

(Table 4). It was almost at par with the national checks OS 6 and Kent for seed yield (Table 5).

The plant height of this variety ranged from 137.5-150.3 cm with an average of 143.3 cm. It is good in nutritional quality as well. The crude protein per cent was recorded to be 9.23 % in this variety. It gave crude protein yield of 12.4 q/ha which was superior to national checks Kent (28.7%) & OS6

(41.4%), Zonal check OL 125(31.9%) and the best qualifying variety OL1861 (14.9%) (Table 6). The *in vitro* dry matter digestibility (IVDMD %) of the variety HFO 607 was at par with the national check Kent and superior to OS 6 (5.03%), the Zonal check OL 125 (5.43%) and the best qualifying variety OL 1861 (5.43%). It was superior to the checks and qualifying varieties for ADF and NDF% also.

TABLE 4
Per day productivity of DMY (q/ha/day): Mean performance (over three years) of HFO 607 in North West Zone of India

Year	Trial Name	No. of locations	Variety HFO 607	National check		NWZ check		Qualifying Varieties			
				Kent	OS 6	OL-125	OL 1869-1	OL - 1861	JO-05 -7	OL-1862	SKO-229
2016-17	IVTO-SC	3	1.13	1.13*	0.93	1.15	1.07	1.01	1.12*	1.01	0.82
2017-18	AVTO-1-SC	4	1.05	0.99	0.9*	0.93	0.94	0.98*	0.87	0.86	0.76
2018-19	AVTO-2-SC	4	1.3	1.11	1.14*	0.9	1.33	1.4*	1.21	1.28	1.17
Weighted Mean			1.16	1.08*	0.99	0.99	1.11	1.13*	1.07	1.05	0.92
% superiority				7.7*	17.2	17.2	4.2	2.7*	8.8	10.5	26.5

*=Indicates the best check/best qualifying variety, IVTO-SC: Initial Varietal Trial in Oats (single cut), AVTO-1-SC: First Advanced Varietal Trials in oats (single cut), AVTO-2-SC: Second Advanced Varietal Trials in oats (single cut)

TABLE 5
Seed Yield (q/ha): Mean performance of HFO 607 in North West Zone of India

Year	Trial Name	No. of locations	Variety HFO 607	National check		NWZ check		Qualifying Varieties			
				Kent	OS 6	OL-125	OL 1869-1	OL - 1861	JO-05 -7	OL-1862	SKO-229
2018-19	AVTO-2-SC-Seed	2	27.6	27.5	26.9	28.7	25.1	21.4	25.2	30.3	27.0

AVTO-2-SC-Seed: Second Advanced Varietal Trials in oats (single cut)-Seed

TABLE 6
Crude Protein Yield (q/ha): Mean performance (over three years) of HFO 607 in North West Zone of India

Year	Trial Name	No. of locations	Variety HFO 607	National check		NWZ check		Qualifying Varieties			
				Kent	OS 6	OL-125	OL 1869-1	OL - 1861	JO-05 -7	OL-1862	SKO-229
2016-17	IVTO-SC	2	12.6	10.2*	6.8	9.7	11.5*	7.7	8.65	8.5	8.6
2017-18	AVTO-1-SC	4	10.1	8.4*	7.9	8.6	8.7	9.1*	7.7	8.1	8.1
2018-19	AVTO-2-SC	4	14.5	10.4	11.7*	9.9	13.3	15.6*	13.15	13.3	11.7
Weighted Mean			12.4	9.6	8.8	9.4	11.2	10.8	9.8	9.9	9.5
% superiority				28.7*	41.4	31.9	10.96*	14.9	26.1	24.9	30.9

*=Indicates the best check/best qualifying variety, IVTO-SC: Initial Varietal Trial in Oats (single cut), AVTO-1-SC: First Advanced Varietal Trials in oats (single cut), AVTO-2-SC: Second Advanced Varietal Trials in oats (single cut)

CONCLUSION

The salient attributes of this variety are high green and dry fodder yield potential; good height and more number of leaves per plant; high leaf stem ratio, bold seeded, good nutritional quality and moderate resistance to *Helminthosporium* leaf blight. In conclusion, the variety HFO 607 possesses all the features of a good fodder yielder along with nutritional quality; hence, it is expected that it will be popular among the farmers of North West Zone of India.

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