



## Performance of back cross derived progenies of *Avena sativa* x *Avena sterilis* for forage yield and related traits

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*Avena sterilis* L. ( $2n = 6x = 42$ ), a wild progenitor of cultivated oats, is an important source of many useful traits like crown rust resistance, high biomass production potential, higher protein content and high growth rate [1-3]. The objective of the present study was to assess the impact of *A. sterilis* germplasm in increasing forage production and related traits when introgressed into background of cultivated *A. sativa* ( $2n = 6x = 42$ ).

The oat collection EC 131306 (*A. sterilis* L.) possessed good forage production potential in addition to its high vegetative growth index. However, this wild collection does combine certain undesirable traits such as coarse and hairy leaves, hairy, light weighted seeds, very low seed yield and high seed shattering character. The strain EC 131306 was crossed to *A. sativa* JHO-851. The maternal parent JHO-851 is a recent released variety for all India cultivation and possesses high yield, regeneration capability associated with good palatability, high nutritional quality. The  $F_1$  hybrid was backcrossed for three years with the recurrent parent *A. sativa*, as in our earlier hybridization programme, the backcrossing for two years have resulted in stable progenies [2, 4]. After third back crossing, progenies were selfed for three generations. Selected progenies (after visual selections in each selfing generation) were evaluated only for agronomic traits in  $BC_3F_4$  generation.

Thirty-one backcross derived progenies were tested for their performance with respect to forage yield and related traits (Table 1) viz. maturity, plant height (cm), tiller number/meter row length, leaf number/tiller, leaf/stem ratio and green forage yield (g/plot of one meter row length). The cultivar JHO-851 was used as a check. The back cross progenies and the check were raised in paired row, each row being 3m long with row to row distance of 50cm and plant to plant distance of 15 cm. Data was recorded on three plants.

Most of the progenies exhibited early/medium maturity except 432-4, 432-7, 432-21, 432-22 and 432-29 (Table 1). As regards plant height and tiller number,

**Table 1.** Mean performance of back cross progenies of *A. sativa* x *A. sterilis* for forage traits

Progeny	Matu- rity (days)	Plant height (cm)	Tiller no./ meter r/l	Leaf no./til ler	Leaf/ stem ratio	GFY (g/m row)	increase over control %
BC 432-1	131	118	90	7	0.90	2485	
BC 432-1-1	142	120	92	6	1.10	2595	
BC 432-2	135	112	84	8	0.85	2200	
BC 432-3	134	131	99	7	1.25	3855	20.47%
BC 432-3-1	142	125	101	6	0.99	2050	
BC 432-3-2	144	130	110	7	1.01	2685	
BC 432-4	154	140	148	7	1.40	3845	20.16%
BC 432-4-1	136	120	95	6	0.88	2815	
BC 432-5	136	128	99	6	0.92	2700	
BC 432-5-1	134	119	89	6	0.90	3090	
BC 432-6	126	110	89	7	0.82	2060	
BC 432-6-1	128	128	100	7	0.89	3260	1.88%
BC 432-7	155	94	101	7	0.98	2135	
BC 432-7-1	145	131	130	8	0.99	4200	31.25%
BC 432-8	134	98	84	6	0.81	2300	
BC 432-9	134	95	91	6	0.81	2550	
BC 432-10	136	110	88	7	0.90	2800	
BC 432-11	136	90	80	7	0.86	2175	
BC 432-12	145	131	91	6	0.98	2700	
BC 432-13	148	91	88	7	0.94	1945	
BC 432-21	156	80	88	7	0.81	1985	
BC 432-22	156	98	110	7	0.95	2475	
BC 432-24	131	90	85	6	0.80	2010	
BC 432-25	137	85	89	7	0.83	1970	
BC 432-26	146	85	93	7	0.84	1890	
BC 432-27	146	92	99	7	0.99	2690	
BC 432-28	127	80	80	6	0.91	2060	
BC 432-29	157	124	140	7	1.16	3650	14.06%
BC 432-30	127	88	96	7	0.80	1850	
BC 432-31	134	111	85	6	0.89	2000	
BC 432-32	146	93	80	7	1.01	2250	
JHO-851 (control)	158	92	156	7	1.31	3200	

SE ( $\pm$ ) for GFY = 112.67

a number of progenies such as 432-3-2, 432-4, 432-7-1 and 432-29 combined tall stature and high tillering potential. However, none of the progenies surpassed the level of tillering potential observed in case of maternal parent. With respect to leaf number, variation was of narrow range. However, comparison of leaf/stem ratio indicated some lines with high values of leafiness. Comparing the progeny performance with respect to forage yield, a number of progenies viz. 432-3, 432-4, 432-7-1 and 432-29 had high forage production potential showing superiority in the range of 14 to 31 %. These lines also appeared to be better than control using standard error as an yardstick. Thus, study indicated that the genes of practical value existing in the wild oat *A. sterilis* could be utilized in improvin the cultivated oats for forage yield and related traits.

It will be desirable to study more *A. sterilis* lines in relation to their combining ability with *A. sativa* lines for different traits. It is evident that *A. sterilis* may

become one of the most important sources of creating genetic variability for improving the cultivated oats for forage attributes.

#### References

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