

SUCCESS OF POD SET BY ARTIFICIAL HYBRIDIZATION IN INDIAN MUSTARD

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A field experiment was conducted to know the success of per cent pod set by artificial hybridization in Indian mustard so as to get more hybrid seed. Ten lines were crossed amongst themselves during three different periods at an interval of seven days. It revealed that highest pod set was observed in first period i.e. 1st to 10th Jan.2006 which decreases with decrease in temperature during other two periods i.e. 16th to 26th Jan 2006 and 1st to 10th Feb. 2006.

Keywords: Hybridization; Indian mustard; Pod set.

Mustard (*Brassica* spp.) is an important oilseed crop and occupies an important position in rainfed agriculture. Mustard oil account for 13 per cent of the world's oil production and supply more than 12.5 per cent of the edible oil in the world.

Pollination behavior in crop plants plays an important role in deciding the breeding methods to be used in its improvement. As Indian mustard is a predominantly self pollinated crop, improvement in seed yield made through selection. To initiate crossing programme by emasculating female parent, it is essential to know the success of pod set by artificial hybridization and the best period for it in Indian mustard. Very few literature is available on success of pod set by hybridization in Indian mustard. The better success of hybridization of the female flowers to get more hybrid/crossed seeds is more dependant on effective pollination at proper time. Therefore, the present paper reports the success of pod set by artificial hybridization in Indian mustard.

Ten lines *viz.*, Pusa bahar, Rohini, Pusabold, BIO-902, Laxmi, HU-JM-03-05, TPM-1, TM-41, RL-1359 and RLM-619 were crossed. The buds of female lines likely to open on the next day were emasculated and bagged by red paper bags and pollinated by the pollen grains of desired male and again bagged by white paper bags. The crosses were grouped into five groups based on the female parents used. The cross wise number of pods set were recorded seven days after pollination and the percent pod set was worked out. The crosses were

thus made for about 10 days immediately on flower initiation starting from 1st to 10th Jan. 2006 and were repeated at an interval of seven days. Thus pollination periods were 1st to 10th Jan. 2006, 16th to 26th Jan.2006 and 1st to 10th February 2006. The pod setting recorded in different crosses during these three periods are presented in Table 1.

The highest percentage of pod set was 81.25 percent immediately after flower initiation in 1st to 10th Jan 2006 with variation in the range of 64.62 to 81.40 percent. During 16th to 26th Jan. 2006, it was in the range of 54 to 67.31 percent. February pollination had the lowest mean pod setting percentage with the range of 30.95 to 48.65 percent (Table 1). The mean pod setting percentage in 1st to 10th Jan. 2006 in group A,B,C,D, and E were 77.61, 77.73, 66.43, 79.04 and 72.59 percent respectively. In 16th to 26th Jan. 2006, it was 56.39, 61.92, 60.30, 57.87 and 63.54 percent. During 1st to 10th February 2006, in group A,B,C,D and E were 40.09, 41.67, 38.27, 38.81 and 36.32 percent, respectively.

During, 1st to 10th Jan. 2006, the pod setting in all the groups were highest as compared to other two periods. It is clear from Table 2 that during 1st to 10th Jan 2006, the maximum and minimum temperature was 28.4 and 10.5 °C and increases from 16th Jan 2006 which affected the success of pod set resulted into decrease in pod setting percentage during two remaining periods. Therefore, the success of pod set in artificial hybridization also depends on early vigour associated with early pod setting and temperature. First flush after initiation

Table 1. Percent pod set in mustard by artificial hybridization during three periods of 2005-06.

Cross	1 st Jan-10 th Jan-06			16 th Jan-26 th Jan 06			1 st Feb-10 th Feb 06		
	NP	PS	PP	NP	PS	PP	NP	PS	PP
GROUP A									
Pusa Bahar x MCN 05-76	48	37	77.08	50	27	54.00	35	12	34.29
Pusa Bahar x TPM-1	65	51	78.46	62	38	61.29	40	17	42.50
Pusa Bahar x TM-41	58	44	75.86	30	19	63.33	55	21	38.18
Pusa Bahar x RL 1359	45	36	80.00	48	30	62.50	60	23	38.33
Pusa Bahar x RLM-619	52	40	76.92	39	22	56.41	37	18	48.65
Mean	268	208	77.61	229	136	59.39	227	91	40.09
Group B									
Rohini x MCN -05-76	32	26	81.25	35	21	60.00	40	18	45.00
Rohini x TPM-1	50	39	78.00	45	32	66.67	58	22	37.93
Rohini x TM-41	62	47	75.81	60	38	63.33	45	19	42.22
Rohini x RL-1359	38	29	76.32	50	29	58.00	62	24	38.71
Rohini x RLM-619	47	37	78.72	70	41	58.57	35	17	48.57
Mean	229	178	77.73	260	161	61.92	240	100	41.67
Group C									
Pusa Bold x MCN 05-76	42	32	76.19	36	23	63.89	39	16	41.03
Pusa Bold x TPM-1	37	27	72.97	42	26	61.90	50	20	40.00
Pusa Bold x TM-41	60	46	76.67	50	28	56.00	45	15	33.33
Pusa Bold x RL-1359	55	44	80.00	39	23	58.97	30	14	46.67
Pusa Bold x RLM 619	49	37	75.51	32	20	62.50	32	10	31.25
Mean	280	186	66.43	199	120	60.30	196	75	38.27
Group D									
BIO-902XMCN -05-76	36	29	80.56	48	30	62.50	30	14	46.67
BIO -902 X TPM-1	43	35	81.40	62	37	59.68	60	21	35.00
BIO -902 x TM-41	58	44	75.86	39	22	56.41	45	20	44.44
BIO -902 x RL 1359	40	31	77.50	45	24	53.33	32	12	37.50
BIO -902 x RLM-619	52	42	80.77	60	34	56.67	52	18	34.62
Mean	229	181	79.04	254	147	57.87	219	85	38.81
Group 'E'									
Laxmi x MCN 05-76	54	40	74.07	70	45	64.28	38	15	39.47
Laxmi x TPM-1	45	30	66.67	52	35	67.31	56	20	35.71
Laxmi x TM-41	65	42	64.62	43	28	65.17	42	13	30.95
Laxmi x RL 1359	37	30	81.08	52	30	57.69	51	20	32.22
Laxmi x RLM 619	58	46	79.31	60	38	63.33	47	17	36.17
Mean	259	188	72.59	277	176	63.54	234	85	36.32

NP - No. of Pollination attempted

PS- No. of pods set

PP- Percent pod set

Table 2. Mean temperature (°C) and relative humidity (%) during three periods of artificial hybridization in Indian mustard, rabi 2005-06.

Period	Temp. (°C)		Relative humidity (%)	
	Max.	Min.	Max.	Min.
1 st to 10 th January 2006	28.4	10.5	61.9	29.8
16 th to 26 th January 2006	32.0	11.6	53.9	28.9
1 st to 10 th February 2006	33.0	13.6	45.0	17.2

of flowering has the advantage of such vigour. Therefore, it is advisable to go for hybridization at an earliest after flowering in Indian mustard.

References

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