RESEARCH NOTES

(I)

FLOWERING STATUS OF *POPULUS DELTOIDES* CLONES IN INDIA

Poplar (*Populus deltoides*) is one of the most popular agroforestry trees in the plains of North India. In view of its economic importance, FRI, Dehra Dun has started a coordinated Poplar improvement programme. Breeding for developing new clones using the available promising clones is an important component of this programme.

A little work on developing new clones has already been done in India through open-pollination and opportunistic control pollination. However, an effective tree breeding programme needs to employ control-pollination in a well-structured mating design. Availability of flowering trees is a pre-requisite for this task. Kumar *et al.* (1999) ranked promising clones of this species and gave information about their sex. Singh *et al.* (1999) proposed the use of an assortative factorial mating design keeping in view the geographical origins and performance of the promising clones. However, carrying out breeding according to this design requires information about dates of anthesis of different clones, effective methods of collection and storage of pollen grains, and actual application of pollen grains on the stigma of female flowers at the right time without contamination from foreign pollen. This note presents the information on dates of initiation of anthesis observed in different clones of *P. deltoides*.

Branches of different promising clones bearing reproducing buds were collected from plantations in the Tarai region of Uttaranchal during first week of Jan. 1997, 1998 and 1999 and planted in nursery as well as grafted on to one year old root stock of same species at FRI, Dehra Dun for making control crosses (Intra-specific hybridization) in *P. deltoides*. Date of anthesis was recorded for each clone and the information was arranged in four groups viz. Group 1 to 4 (Table 1). Several other clones which are not included in the breeding programme of FRI were also observed in the plantations and their sexes were recorded to enable their use in future programme.

Table 1 shows that anthesis in different clones is asynchronous, spread over more than a period of one month (around 40 days). The duration of period when flowers are open is also variable. It has been seen that flowers in most of the clones are open during 3rd week of March. Control crosses can be made between most of the male and female pairs of clones during this period. The fruit and seed set in control pollination done during this period has also been found to be best. Hence 3rd week of March is the best period for carrying out control-pollination work. However, the pairs which cannot be crossed due to non-overlapping flowering need to be made by storing pollen grains in refrigerator.

Of 136 different clones of *Populus deltoides* studied for flowering status, information on anthesis is provided on 40 clones and the rest are identified for sex in plantation and experimental field trials.

Table 1

Dates of anthesis of different clones of P. deltoides and their sex

Group I : Date of initiation of anthesis : 5 to 14 March

Male Clones :

1.	S7C15	2.	D72	3.	82-36-1	4.	S7C20	5.	D82	6.	D75
7.	S4C2	8.	G3	9.	82-42-5	10.	S4C21	11.	3167		

Female Clones :

1.	S7C7	2.	3567	3.	D121	4.	82-33-3	5.	D124	6.	82-40-2
7.	G48	8.	L-200/84	9.	S7C8						

Group II : Date of initiation of anthesis : 15 to 25 March

Male Clones :

1.	S7C2	2.	S7C1	3.	421-2	4.	113324

Female Clones :

1.	D121	2.	82-35-4	3.	82-29-4	4.	L-34/82	5.	L-153

Group III : Date of initiation of anthesis : 26 Mar. to 10 April

Male Clones :

1.	D67	2.	D66	3.	404-3	4.	A-13

Female Clones :

1.	110702	2.	3324

Group IV : Date of initiation of anthesis : No anthesis occurred

Male Clones :

1.	S7C4	2.	D74	3.	D244	4.	2502

Female Clones : Nil

Group V : Other clones which are not included in breeding programme of F.R.I.
(Date of anthesis on trees not recorded)

Male Clones :

1.	S13C11	2.	S7C3	3.	S13C14	4.	82-28-1	5.	D61	6.	D78
7.	D70	8.	D29	9.	82-82-1	10.	73-53-7	11.	82-41-4	12.	721502
13.	110504	14.	110120	15.	111510	16.	28/3	17.	53/66	18.	19/66
19.	28/13	20.	56/58	21.	69/58	22.	4/64	23.	440-3	24.	A-304
25.	3677	26.	3234	27.	2503	28.	ONDA				

Contd...

Female Clones :

1.	L-240/85	2.	L-287/85	3.	L-327/85	4.	L-325/85	5.	L-324/85	6.	L-150/85
7.	L-147/85	8.	L-179/84	9.	L-130/84	10.	L-184/85	11.	1147	12.	D238
13.	L-142/85	14.	L-117/84	15.	L-284/85	16.	L-142/84	17.	L-229/84	18.	L-498/84
19.	L-216/85	20.	L-160/85	21.	L-158/84	22.	L-187/85	23.	3568	24.	D181
25.	5748/111	26.	111828	27.	82-14-1	28.	82-36-2	29.	82-26-5	30.	82-39-2
31.	EL-89-92	32.	L-169/84	33.	L-181/85	34.	EL-74/82	35.	3263	36.	D50
37.	L-12/85	38.	L-62/84	39.	L-75/84	40.	L-75/84	41.	L-39/82	42.	Lux (69/55)
43.	L-22/82	44.	L-29/82	45.	L-74/84	46.	L-11/85	47.	D131	48.	D108
49.	L-51/84	50.	L-13/85	51.	L-79/85	52.	L-73/84	53.	L-85/85	54.	L-40/85
55.	EL-67	56.	EL-91	57.	79.58	58.	EL-111	59.	D153	60.	3931
61.	EL-21	62.	EL-111	63.	51/84	64.	57/64	65.	63/51	66.	430-4
67.	2/56	68.	3651	69.	3201						

References

Kumar, D., N.B. Singh, G.S. Rawat, S.K. Srivastava and D. Mohan (1999). Improvement of *Populus deltoides* in India - I. Present status. *Indian Forester,* **125** (3) : 245-263.

Singh, N.B., D. Kumar; G.S. Rawat and S.K. Srivastava (1999). Improvement of *Populus deltoides* in India - II. Future strategy. *Indian Forester,* **125** (4) : 341-354.

Silviculture Division,
Forest Research Institute,
Dehra Dun (Uttaranchal)

R.K. Gupta,
Kadam Singh,
Dinesh Kumar*,
Y.K. Srivastata**
and N.B. Singh

*Extension Division, FRI, Dehra Dun.
**Forest Research Range, Lalkuan, Haldwani (Uttaranchal)