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BREEDING NEW PIERIS CULTIVARS

ROBERT L. TICKNOR

*North Willamette Experiment Station
Oregon State University
15210 N.E. Miley Road
Aurora, Oregon 97002*

Plant breeding was one of the projects to be conducted at the newly established North Willamette Experiment Station of Oregon State University when I was hired in 1959. *Pieris* was chosen as there were several species and a number of named cultivars of *P. japonica*, none of which were known to be the result of hybridization. Among the objectives were development of plants with growth habits different than the narrow, upright habit of *P. japonica*, fade resistant pink flowers, and bright red growth.

Thirty different plants were acquired in 1959 and 1960 from local and eastern nurseries including one or more of the following species: *Pieris floribunda*, *P. formosa* and its variety *forrestii*, *P. japonica*, *P. nana*, *P. phillyreifolia*, and *P. taiwanensis*. Also obtained was a plant of *P. 'Forest Flame'*, which is reported to be a natural hybrid between *P. formosa* var. *forrestii* and *P. japonica*. Results of attempts at interspecific hybridization in *Pieris* by Dr. Richard Jaynes and I have been reported (1).

Seven of the *P. japonica* forms were supposed to be pink but all resembled the one honestly named 'Pink Bud'. The pink bud types crossed together did not result in any darker pinks. The real break for breeding dark pink *Pieris* came in March, 1961, when I was called to Lambert Gardens, a display garden and landscape firm in

Portland, Oregon, about a weed control problem. I noticed a group of almost maroon-flowered *Pieris* for sale and bought one.

A truss was sent to Dr. Donald Wyman at the Arnold Arboretum, who wrote that the plant was very unusual and should be named. This letter was shown to Mr. Lambert and the name 'Flamingo' was suggested to him. The color does not match that of a flamingo but flamingos were among the exotic birds in the garden and the name would have good publicity value.

As far as I have been able to trace the origin of 'Flamingo' was that it was found growing in a Portland garden by David Hutton. Mr. Hutton had come to the U.S. to work for Mr. Lambert after completing training at the Botanic Garden at Edinburgh; he later returned to Great Britain.

'Valley Rose', the first *Pieris* named from the breeding program, resulted from crossing 'Flamingo' with 'Deep Pink', from Mitsch Nursery, Aurora, Oregon in 1961. 'Valley Rose' grows wider than tall but the flowers do become quite light pink at the end of the blooming period.

'Valley Valentine' resulted from a cross of 'Flamingo' with 'Valley Rose' done in 1966. The red flowers of 'Valley Valentine' open by February 14 in the Portland area. The color is impressive close up but doesn't give much contrast with the dark green leaves at a distance. We are still trying to produce a non-fading medium pink but so far if we get this there are other faults such as leaf spotting.

A recent goal in the breeding program is later blooming plants. A high percentage of *Pieris* plants produced on the U.S. West Coast are shipped to the Northeast where flowering starts in April. 'Valley Fire' (*P. formosa* var. *forrestii* × *P. japonica* 'White Caps'), released in 1976, is late blooming but is not hardy enough for the Northeast. Actually 'White Caps', selected in New Jersey, is one of the latest flowering *P. japonica* plants. Promising late blooming seedlings have resulted from a cross of *P. japonica* 'Red Mill' × *P. japonica* (NA 40269D) collected at 5400 ft. elevation on Yakushima Island, Japan by Skip March of the U.S. National Arboretum. They have compact habit, red new growth, and white flowers.

Also late flowering mid- to late-March are a group of compact white-flowered cultivars from Firma C. Esveld in Boskoop, Holland: 'Cavatine', 'Chaconne', 'Nocturne', 'Prelude', and 'Sara-bande'. They are also derived from seed collected on Yakushima, Japan.

HYBRIDIZING METHODS

All crossing is done on potted plants brought into a heated greenhouse when the first florets start to open. An exception would be on seedlings blooming for the first time out-of-doors that usually are used as pollen parents.

The corolla and anthers are removed on ten florets on a raceme

for each cross. Florets from the plant to be used as the male have the corolla and pistil removed then the anthers are tapped on a thumb nail. The nail is much easier to guide and clean than a brush. It is also easier to see the tracks in the pollen than to see the pollen on the stigma. By pollinating 10 florets, one or more should be in a receptive condition and sometimes we get 8 capsules; of course, other times it is zero. Very little if any seed results from selfing most *Pieris* plants.

Seed is harvested in late summer when the capsules start to turn brown. Seed is sown on milled sphagnum moss over a sterile potting medium in 6 cm² × 9 cm deep plastic pots after January 1. If available, enough seed to produce 100 seedlings is sown in each pot. The seed is not covered with the sphagnum moss but is misted almost every day. A sheet of glass is placed over the pots which are 15 cm below a fluorescent light unit operating 16 hours per day. When the lights are on the temperature is about 27°C and drops to 19°C during the night in our office basement.

Any excess seed is held in paper envelopes placed in polyethylene bags which are stored in a refrigerator. Seed remains viable at least one year at 4.4°C (40°F).

Around March 1st seedlings are transplanted, one hundred to a 38 × 50 cm flat. They are grown at 13°C night temperature with a 4-hour light break from 10 pm to 2 am in a double layer polyethylene house. In June, the flats are moved to an unheated polyethylene house where a culture of *Phytophthora cinnamomi*, obtained from Dr. Robert Linderman, U.S.D.A. Horticultural Crops Laboratory, Corvallis, is spread over the flats.

In July and early August, the survivors are transplanted into pots. The initial selection is based on foliage and growth characteristics. Evaluation of flowers takes 3 to 4 years, then propagation trials are started. Evaluation in the ground takes place with cuttings rooted from the selected plants, since plants inoculated with *Phytophthora* remain isolated.

Selected plants are sent to other locations for evaluation before naming and introduction.

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