

Polyanthus, *Primula x polyantha*, Breeding

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My interest in polyanthus goes back to the heyday of the original Pacific Strain produced by the California firm of Vetterle & Reinelt (V & R). My brother and I grew these in the open ground and sold them wrapped. They were huge and took with them vast amounts of soil. Our observation was that customers liked to select more than one colour and plants with unusual markings. As the viability of the seed we bought in was low on arrival and the cost high, we decided to separate a few of the more unusual selections and to start producing these ourselves.

After about five years our efforts were helped by the gift of a few packets of V & R seed from an old friend Alex Purdie of New Plymouth. Alex knew what we were trying to achieve and thought it better that we had the "special seed to play around with".

Germination was patchy but we got a number of very unusual and, in some cases, strange plants. The best of these we selfed and repeated a second year. We matched colours and grouped them as V & R had done and have continued to do so ever since.

Our first objective was to establish a basic colour bank and then to produce as many cultivars as possible. Exhibition heads with large strong stems were the ideal at the time. We also needed a balance of "pins" and "thrums" to give a high percentage of viable seed when crossed.

METHODS

Sowing. We sow the seed as soon as it is harvested which is usually November (early summer). Seed needs diffuse light and it should be uncovered, although we anchor it very lightly with fine vermiculite. When using plugs a plastic sheet is placed over each tray and these are stacked in a shed where it is cool. Temperatures should not go above 16°C. Once germination starts there is a critical stage at which the seed should be covered completely and the trays moved to a cool house.

We grow 15,000-20,000 plants each year in 1/2 pint plastic bags. One batch consist of special crosses and the other our current year's seed crop. This has proved invaluable when growers have experienced problems with our seed, e.g. poor germination, as we have been able to invite them to view our results and to take home some replacements to help them over their disaster.

We are unable to produce seed of all strains by the beginning of October which is when most growers would like to sow it. We have found the seed can sometimes be stored for up to 10 years in the deep freeze and germination in some strains can be enhanced after a couple of years storage.

Selection. As the crop matures and flowers, we select as many as we can from the early-flowering plants. Later we may add others as choice plants are noticed. Colour groups are compiled and special groups structured where a new break is extended to other combinations. Pollination starts in July (mid-winter) and continues until late September. We have found when trying to isolate a characteristic that it is necessary to carry over summer desired parents and backcross.

Polyanthus has pins and thrums. Once the choice of combinations is made we emasculate a colour group of each type and the pollen is transferred from the anthers. Although we try to hybridize only during good weather, weather conditions are not critical with polyanthus, and they will pollinate quite late in the day.

Once a cross is made the plant has to be checked daily until the stigma dries. The stigma is prone to *Botrytis* attack in early season crosses and pollinations made on high humidity days. Those that become infected must be removed.

Harvesting. This takes place normally from the end of October to the end of November, but sometimes as late as December. Once the top of the seed head cracks and shrivels, it is harvested and placed on newspaper in seed trays. During the first two days the leafy calyces are removed to make cleaning easier. In a warm, dry spot out of direct sunlight it takes only two to three days for the heads to firm and the seed to turn brown.

The husks are rubbed lightly over an Endecott sieve (2.8 mm) and the seed winnowed to remove the old husks. The resultant trash and seed is then put through a series of finer sieves and we finish with a mixed grade of seed sizes with an average 1300 seeds per gram.

CONCLUSION

Over the years we have had to change direction as demand has moved from the exhibition head to the more compact acaulis types. However we are continuing to aim for plants that are adapted to New Zealand conditions and which have:

- 1) flowers with good form, size, colour, distinctive ruffled and picoteed edges, and enhanced centres
- 2) increased disease resistance
- 3) flowers that are multiheaded and self-cleaning
- 4) uniform stem lengths.

Our latest effort has been towards the development of hybrids based on the Julians to be used as bedding plants that will withstand New Zealand spring and early summer weather.

It can be very complicated trying to improve an overall strain with infinite colour and maintain a commercial product at the same time. Plant breeding is time-consuming: one needs to start young, take an interest in your favourite plant and aim for goals. Preferably pick a plant that can be micropropagated and afforded plant variety rights.