PAEONIA

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"And she brought forth her first-born son, and wrapped him in swaddling clothes, and laid him in a manger; . . ."
Luke 2:7

MAY GOD BLESS
EACH ONE OF YOU
DURING THE
CHRISTMAS SEASON
AND IN THE NEW
YEAR --
Chris
and
Lois

ROY PEHRSON'S REPORT ON HIS "ITO TYPE" CROSSES OF 1971

I'd decided to make a perfunctory report — with apologies, because my results don't make the sense I'd hoped. I'll give it all to you so you can see what I mean.

'**Largo**' x '**Aurore**' - 3, 3,1,1,1, 0, 0, 0, 0, 0, 0, 0, 0, 0

'**Vesper**' x '**Golden Isles**' - 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0

'**Vesper**' x '**Amber Moon**' - 3, 2, 2, 1, 1, 1, 0, 0, 0, 0, 0
'**Nippon Beauty**' x '**Amber Moon**' - 1, 1, 0, 0, 0, 0, 0, 0, 0, 0

'**Vesper**' x '**Golden Bowl**' - 1, 0
'**Ama no Sode**' x '**Golden Bowl**' – 0, 0, 0, 0, 0
'**Minnie Shaylor**' x '**Golden Bowl**' - 2, 1, 1, 0, 0, 0, 0, 0

'**Plainsman**' x '**Argosy**' - 1, 0, 0, 0, 0
'**Christine**' x '**Argosy**' - 2, 1, 1, 0, 0, 0

'**Kate Barry**' x '**Chinese Dragon**' - 2, 1, 0, 0, 0, 0

'**Moon of Nippon**' x tall lutea – 0, 0, 0, 0, 0, 0, 0
'**Mary Moy**' x tall lutea - 0, 0, 0, 0, 0, 0
'**Ama no Sode**' x tall lutea - 0, 0, 0, 0, 0
W. Jap x tall lutea - 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
'**Petite Rene**' x tall lutea - 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
'**Vista**' x tall lutea 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0

'**Golden Dawn**' x lutea # 14 - 3, 2, 0, 0, 0, 0, 0, 0, 0, 0
'**Vesper**' x lutea # l4 – 0, 0, 0

'**Vesper**' x Delavayi/lutea #1 - 2, 1, 1, 0, 0
'**Petite Rene**' x Delavayi/lutea #1 - 3, l, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0

'**Nippon Beauty**' x Delavayi, tall maroon – 1, 0, 0, 0, 0, 0, 0, 0, 0
'**Vesper**' x Delavayi, tall maroon – 0, 0, 0, 0
Pink jap x Delavayi, tall maroon – 2, 2, 0, 0, 0, 0
Pink jap x Delavayi, tall maroon – 2, 0, 0, 0, 0

'**Golden Dawn**'x Ludlowii - 1, 1
'**Vesper**' x Ludlowii - 13, 4, 3, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0

'**Gay Paree**' x *Potaninii* - 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
'**Golden Dawn**' x *Potaninii* - 5, 0, 0, 0, 0, 0
'**Nippon Gold**' x *Potaninii* - 4, 3, 2, 1, 1, 1, 0, 0, 0, 0, 0, 0

'**Nippon Brilliant**' x F_2A – 4, 2, 1, 1, 0, 0, 0, 0, 0, 0, 0
'**Petite Rene**' x F_2A – 0 0
Giant Jap x F_2A – 2, 1, 0 0 0
'**Shaylor's Sunburst**' x F_2A – 7, 5, 4, 2, 2, 2, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0

There is something wrong in all this. In some way I have surely goofed for there are certainly too many seeds. Probably in almost every group of crosses listed some of the seeds harvested are not real hybrids.

In order to modify these data so as to make them more realistic, I'll make some assumptions:

1. Where single seeds are shown they are genuine.
2. Where two in a pod, one only is real.
3. If three or more - none is hybrid.

Having "corrected" the totals in this manner, it is now a simple matter to compute values or percentages representing the comparative effectiveness of each pollen in producing hybrid seeds. Simply divide the number of seeds assumed to be hybrids by the total crosses made. It works out like this: -

F_2A _____ .45	'**Aurore**' _____ .36	Lutea No. l4 _____ .20
Ludlowi _____ .44	Potaninii _____ .29	Delavayi/lutea #1 _ .16
'**Amber Moon**' .38	Tall Delavayi _ .25	Tall lutea _____ .10
'**Argosy**' _____ .36	'**Golden Bowl**' .20	'**Golden Isles**' ____ .07

My previous guess that lutea and delavayi (species) pollens might be more effective than the hybrids is not supported by this data and I'm compelled to abandon it.

Dave Reath suggested that unreduced gametes may have played a part in the production of the "lutea" tree peonies. On reflection I can only agree. If it's true, then all the following statements probably are true also.

1. The lutea x suffruticosa cross is possible only when undivided gametes are involved.
2. All F_1 "lutea hybrid" tree peonies are triploid.
3. F_2 plants and backcrosses may be either diploid or tetraploid, and possibly fertile.

In the making of "Ito" hybrids the following statements, though less certain, are also probably true.

1. The cross is possible only when the pollen plant provides 10 chromosome gametes.
2. The "Ito" hybrids are triploid.
3. Lutea (species) or delavayi (species) pollens will be less effective than any other because unreduced gametes again required.
4. F_1 hybrids somewhat better - some gametes will normally contain all 10 chromosomes.
5. F_2 lutea hybrids will be most effective of all if tetraploid. All pollen grains will have 10 chromosomes.

It's on the basis of argument No. 5 that I obtained some of Gratwick's advanced generation hybrids to try. Perhaps one or more of these may be tetraploids. I'm going to try my best to get more hybrid plants. If I don't succeed I won't be too disappointed. It's going to be immensely interesting to watch the baby plants I now have grow into adulthood.

HALCYON

Description of this plant is to be found in "THE PEONIES" by John C. Wister, page 95.

Halcyon (1948) 24", single, very early, large waxy white flowers, may have some pale lavender streaks and spots at petal base. Petals a bit twisted sidewise. The 4 pistils are big, long and fuzzy, light gray. Stamen tops yellow cream.

> Saunders 1952 catalog. - A quite new race of hybrids, sold as a strain only. Fine carriage with stout stems. Flowers of heavy substance, faint mauve on greenish ivory ground, with dark flares. Unique and beautiful.
>
> Saunders 1955 catalog. - Single - Blush - Very Early - Hybrid. Opens the last week in May, palest flush, becoming pure white, of finest kid-like substance, with marked purple flares. Crimson stems, stigmas and filaments make this a most finished plant. Albiflora x Ozieri alba.

See page 52 of "THE PEONIES" for additional description of this beautiful strain which includes seven clones

PAEONIA, June, 1972:
The late Roy Pehrson wrote of the strain called Halcyon: "There are, or were, 7 plants from 3 different lactiflora seed parents, all almost exactly alike, also very sterile. Both parents are diploids. Saunders' book (notebook) tells that four F_2 plants were set out from the seed beds, but there is no further mention of them."

Chris Laning: Many years ago Silvia sent me a plant of Halcyon F_2 * (A description of it was presented in an issue of PAEONIA). The plant is erect, standing straight as a soldier having excellent foliage and is disease resistant. This Halcyon F_2 has beautiful white single flowers about 4" in diameter. The blooms stand at the top of the stems and just below are 3 or 4 very small side flowers. I know of no other peony that has this charming feature.

In writing this account I am happy to say Halcyon F_2 will set seed — never many — but it is very encouraging even though they are but few. Seeds will willingly germinate but until now have winter killed in their second year. I guess they must be given the same care as the tree peony seedlings get. As of now, there is a pot of two or three seedlings that are 1 year old. These are being protected from freezing!!

I keep hoping to display the Halcyon F_2 at our Peony Show to excite and encourage our hybridizers, but it blooms so early that 'til now it was (and is) not possible.

** Halcyon F_2 named 'Tranquil Dove' (1993)*

DELAYED GERMINATION

Why do some seeds delay germinating while others promptly develop? There is a row, perhaps 100 feet long, of tetraploid seedlings that started growing three years ago. These seedlings were dug up this fall. It was easy to see that some plants were three years old (some of which have bloomed) while others were two or one year olds. Also, some seeds were just starting to root. That means that three, two, one, and zero year old seedlings all came from this one planting. Each age group is growing in its own section as an experiment to find if there will be any differences in age groups. It's easy to assume that the precocious seedlings will be singles and the slower ones will be doubles, but is that true? Early development vs. late development experiment should give the answer though clear-cut answers are hard to come by.

- Chris

A reprint of two articles from the late Roy Pehrson — PAEONIA, Sept. 1972:

BENLATE (BENOMYL)

It was a disappointment this summer to discover that about one-third of my "Ito type" hybrids seem particularly subject to attack by fungus, they have brown spots with lighter, orangey centers. Some others are entirely unaffected.

Quite a bit has already been reported about favorable results from the use of Benlate as a systemic fungicide. Whether or not it has yet been used on peonies, I do not know, but thought I would give it a small try.

I have a number of plants of the lactiflora '**Vista**' which is particularly subject to fungus attack in late summer. This should be a very good subject for a test. I'm spraying two plants weekly and leaving the others unsprayed for controls. This was started the first week in July when the plants were already somewhat infected. If, by September, I can see any marked difference in these plants, I'll report the fact.

I'm going to destroy my plants of '**Vista**'. Most of its seedlings are also very susceptible so I don't want to use it in breeding any longer. When possible we should avoid using any varieties but those which seem to be fungus-resistant.

Some experiments being conducted in Wisconsin suggest very strongly that elm trees already showing evidence of infection with Dutch Elm Disease can be saved by either injection or foliar spray, using Benlate. The June, 1972, issue of Weeds, Trees and Turf contains an article on this subject.

Benlate is insoluble in water so a spray consists of only a suspension of small particles in water. The amounts absorbed into the circulatory system of a plant must therefore be very small indeed. Apparently only an infinitesimal amount of Benlate needs to be absorbed to be effective.

- Roy Pehrson

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The problem Roy had with some of his Itoh Seedlings he's identified as a genetic problem (not subject to fungus attacks). Though there is no description in peony literature, Roy's label of "measles" is an apt description of the occurrence.

Several "measles" plants were given to me. They have grown vigorously for years, always maintaining the leaf spotting effect. I, too, believe the problem is genetic since nearby plants are never contaminated with this malady. These plants have flowers that are ugly and worthless. I now have a whole row of them, so investigating and evaluating this odd condition can be done anytime.

- Chris

p.s. I think these plants are the result of a cross—lactiflora x suffruticosa, not lacti x lutea hybrids!

ABOUT BENLATE

Roy Pehrson (From PAEONIA, Sept, 1973)

Last year I wrote about trying "Benlate" for the control of "leaf spot" or "measles" on peony foliage. Up to now I have not reported my results.

There were four plants of the very susceptible lactiflora "Vista" which I used for the test. All four had numerous small spots by the time I sprayed for the first time. Two of these were sprayed four times at weekly intervals and the other two were left unsprayed.

The result was not completely convincing. Spots on the sprayed plants continued to enlarge somewhat and some new spots may have appeared too. I was sure that the other two plants were more severely affected. One of those two became blackened to the extent that some of the upper stems dried off and the seed pods failed to mature.

On the basis of this very limited test I would be inclined to conclude that this material cannot be counted on for complete control. I suspect that results might be really quite good if treatment were to be started earlier in the season. I know of nothing else which is of much value. The experience of Mr. Alexander shows that it is very effective in the control of botrytis.

I believe this material is going to make most other fungicides obsolete if its cost becomes competitive. I paid nearly three dollars for a one ounce package, but I believe that in commercial sized quantities it can be obtained for about ten dollars a pound.

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SEED FOR DISTRIBUTION

We still have a good supply of seed from various sources. June planting of peony seed is ideal!

SOURCES:

Domoto - California tree peony seed

Simkins
- lactiflora from Cousins clones
- lactiflora from Karrels plants
- lactiflora from Glocka's garden
- T.P. seed
- species mix. Berry Botanical Garden

Rogers - tree peony seed P. peregrina

DeReamer
- lactiflora Lotus Queen F2 open pollinated
- all pink or white Japs or anemones, about T tall & 7 short
- named clones - White Cap, Walter Marx, Bo Peep, Lotus Queen, and Miss America

Sender's Name Lost - open pollinated lactiflora, and a good amount of tetraploids mix.

Chris - Roy's Best Yellow F2. All flowers will be white or cream; these will develop into very good tetraploid seedlings.

Mrs. J. R. Allan - P. ludlowii - very good yellow tree peony but not hardy in Michigan area

RESULTS FROM "FERTILIZER TO HELP GROW PEONIES"

Don Hollingsworth
May, 1974

A progress report on my use of heavy applications of commercial fertilizer on peonies can now be made. I had some "burn" from excess muriate of potash in a second application during late April. On the positive side, however, some of the peony flowers showed dramatically improved color compared to previous seasons when little or no fertilizer was used.

The good results from heavy fertilization were more than had been hoped for. Many seedlings flowered for the first time and I am confident most of these would have flowered last year had I been fertilizing regularly. Older plants gave more and finer flowers than they had ever produced before in my garden. For the first time in five years of flowering '**Ellen Cowley**' gave flowers like I saw of it at the 1972 Minneapolis National Peony Exhibition. I can now understand what Dave Reath means when he writes in his catalogue that '**Ellen Cowley**' is like '**Cytherea**'. As a group the Saunders Lobata Hybrids, which are a big thing among peonies to me, were more highly colored than I have had previously.

Perhaps the most surprising result was the discovery that I have a "scarlet" tree peony. About eight years in its present location the plant had long ago been dubbed "Rose Pink," although at times the flower color was near red shortly after opening. However, it soon passed off to familiar blue tones. This year, the petals had color tones close to those of '**Laddie**' and retained this color until petal fall. What is most frustrating is that during the past five years I have added several tree peonies selected for scarlet color which have so far declined to flower. Meanwhile, I could have been using pollen from my old "scarlet" had I recognized it!

At the outset I had settled upon the plan of using a mixed fertilizer balanced to give an analysis of 1:2:2 or 1:3:3 (nitrogen : phosphate : potash, respectively). This was to be applied in the amount necessary to give 2 lbs. of N (nitrogen) equivalent per 1000 square feet of bed area for the whole season, half to be given in early March ahead of growth and the remainder about mid-May. The higher amounts of P (phosphate) and K (potash) would assure a rich reserve of these nutrients without risking N excess. I was later to be reminded that potash should be carefully controlled also when applied at high rates.

Superphosphate, the common P source used in mixed fertilizers, should be placed well into the root zone because it is not much soluble and does not move well with the soil water. Since annual treatments to perennial plants cannot be placed deeply into the root zone, the more soluble combination product ammoniated superphosphate (N&P) is the better choice. In Kansas City around March first it was tough to find any fertilizer in bag-sized lots, let alone find a particular formula. After considerable running around I located enough for immediate requirements by accepting some of 0-24-24 and some of 12- 24-24 (percentage analyses of N-P-K). Only after commencing to apply this material did I realize I had overlooked the matter of ammoniated superphosphate. When I attempted to make a water

suspension of the 12-24-24 for seedling frames it took several days soaking just to get the pellets broken down enough to give the even distribution desired. So, I went back to the dealers and took 12-12-12 made from ammoniated superphosphate. Now it would be necessary to compromise the original plan of amount to use.

That wasn't the only compromise of plan, however. In the press of spring work my zeal for accuracy and precision fell by the wayside. After the 12-12-12 had been put on, guided from observing the appearance of how thickly the granules lay at half cup in a ring around a plant, I found that I actually about doubled the intended rate. By crude measure, I estimated that around 20 pounds of 12-12-12 was applied per 1000 square feet or 2.4-2.4-2.4 (lbs.) of each N, P and K, respectively. This was just the early treatment and I had already exceeded the intended amount of N for the whole season. At that time I still planned to use additional potash in nematode areas, but did not then get it on.

Later, I acquired a supply of 5-20-20 with trace elements: boron, manganese, molybdenum and zinc. (Hybridizers please note: although boron in larger amounts is toxic to plants, as a trace element it is of critical importance in pollen production and pollen tube growth. When deficient, pollen is not produced by some plants and if deficient in the seed parent the pollen tube may be unable to grow through to the ovum. Boron's role in peony pollination has not been determined, however.

Application of the 5-20-20 was immediately made around plants growing in the nematode area. Besides, I then added the muriate of potash which had been intended for earlier application. I foolishly did not take time to compute amounts, perhaps over confident because things had gone so well after the earlier application of greater than intended amounts. At any rate, a few leaves and stems soon wilted and died, very similar in appearance to that of a flat of annual seedlings which has been allowed to dry out. When water has been restored it is found that some of the plants turned black and dried up. That is the way these few stems and/or leaves of peony looked and I laid it to the potash in the late treatment, for the potash is as soluble as table salt and very similar in chemical composition.

This loss of a few seedlings doesn't mean (to me) that the fertilization should be stopped. It does tell me, however, that I must use the scales to measure amounts appropriate to measured bed areas. Then I must take pains to assure even distribution, especially in crowded seedling areas where it is not possible to keep the chemicals in the outer zone of roots, several inches away from the stem zone. A water solution (or suspension) may be the best way to get uniform distribution on smaller areas where plants are crowded.

Overall, I am satisfied with fertilizer results so far and will continue to evaluate what happens as a help in planning future use.