THE PEONY NEWSLETTER
For Beginning Hybridists and Advancing Hybridists

Volume 2, No. 1. January 1971

REQUIRED READING

THE PEONIES. ed. by J. Wister, available from the American Peony Society. Price $3.50. This book is a must for every hybridiser --- our "Bible."

The Bulletins of the American Peony Society. 107 1/2 W. Main Street, Van Wert, Ohio, 45891 (many articles for all and an enrichment of thought.)

THE PEONY, ...ed. by J. Boyd (available only at libraries but still contains a lot of worthwhile readings.)

SRB, OWEN, AND EDGAR
(advanced reading on genetics.)

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Is under the auspices of the Peony Society with APS President Silvia Saunders and, as a Reference Person: Roy Pehrson, who will help guide the hybridists. Send all materials and questions to Roy Pehrson, Lafayette, Minnesota, 56054

Send all contributions to Secretaries: Mr. & Mrs. Don Kozak, 3901 Harvard Drive, Willoughby, Ohio, 44094.

Suggested contribution is $2.00 to cover expense of printing and mailing.

We will try to divide the Newsletter into items of concern to the hybridists; beginners, more advanced members and some general information on improving the Peony through hybridizing. We ask you to read and reread The Peonies by Wister.

TO OUR READERS:

Please feel free to write us about your work or observations concerning the peony. If you have any questions or would like a question answered let us know.

Do to unforeseen circumstances it has become impossible for us to continue as secretaries of the newsletter. We are turning the newsletter over to the new secretary until we are able to resume its publication again.

We would like to thank you for your support and hope you will continue your letters of encouragement.

We hope you all have a good year ahead. If your peonies are not covered with a blanket of snow, be sure they are protected from the freezing weather with a good mulch. Protect young plants the most as they are more apt to freeze.

THE "ITO" CROSS

How difficult is the Ito cross? American dealers in tree peonies have never been able to depend on some Japanese suppliers sending them young plants which are true to name. Hybridizers, in general, may wonder whether the story as given to Mr. Smirnow may have contained exaggerations or distortions of some sort.

This summer, for the first time, I found some baby seedlings in my lacti x Lutea hybrid groups which are unmistakably genuine hybrids. They are mostly a much paler shade of green, are not at all glossy, and have a pattern of dissection and lobing very much like that of tree peony seedlings. In a few, these contrasts are less distinct and some of these may be doubtful.

I have color pictures of some of these groups, which also contained seedlings from a contaminated cross. The contrast shows very plainly. I sent prints to several hybridizers, asking them how many seedlings they have resembling mine, and the amount of crosses made to obtain them. Here is what I have learned up to now:

Mr. Ito: Made 1200 crosses, obtained 9 true hybrid seedlings.
Myself: Made 582 crosses, obtained 13 - 18 true hybrids.
Mr. Cooper: Made 150 - 200 crosses, obtained 1 true seedling.
Mr. Reath: Made 100 crosses, no true seedlings.

On the basis of this comparison. I would assume that one true seedling would result from each 100 crosses.

Maybe my own results are overstated. I probably should not count plants until they have survived into a second year.

I suspect that in the mixture of pollens I used, there was one which was especially effective. The pollens were obtained at the Kingwood Center show. All the pollen was put into one container. I do, however, have several seedlings from '**Thunderbolt**' and '**Corsair**'.

I managed to make far fewer crosses this past season. I may have a few seeds from '**Amber Moon**' and '**Age of Gold**'. I will have to wait to see if they germinate.

One fact is certain, I feel there is no special magic in the make- up of '**Alice Harding**' to make this kind of cross possible. Possibly any of these hybrids can be used, providing pollen can be found in them. Mr. Cooper has made pollen viability tests of several and apparently finds them to be about 5% viable.

Whether or not such odds as these appeal to you, will depend on your own circumstances. I do believe it is by far the most interesting cross to try if one has the lactifloras to use. Since only nine seedlings of this cross are known to the public, the standard of excellence has not yet been raised very high. Any hybridizer should expect to find among his seedlings a high proportion of "good" ones.

Mr. Ito convincingly disproved the long held opinion that tree peonies cannot be crossed with the herbaceous ones. It is difficult, but not impossible. The Ito hybrids themselves should be backcrossed on lactiflora. It is quite likely they will work. The F2 and back crosses among the lutea and delavayi are likely to work better than the Fl plants do. I believe, all the tree should be used.

TETRAPLOIDS

Almost invariably those who write to me say they intend to concentrate on tetraploids. One great disadvantage in this is the fact that recessives are vastly harder to retrieve from tetraploids than from diploids. The diploids, however, are more difficult to cross. I will go into this in greater depth at a later date.

SEEDLING 1970

This past season I found only one seedling which held much fascination for me. It was in a group of four plants of '**Archangel**' x '**Moonrise**'. The other three did not bloom. It was a single nine petal bloom with some yellow in it. Those who might like to see it can write to me for a picture.

Hybrids which cannot be faulted on some character are going to be very rare. The form and the substance of the two blooms were as perfect as it was somewhat novel. The foliage though was questionable. Although it is a tetraploid, the leaves were thin and they become shabby much too early. I shall have to give it a good close look next summer.

PROFESSOR A.P. SAUNDERS

Professor Saunders' notebooks contain a few comments which may not yet have been published. I will include one of these from time to time. Here is the first one.

"Albiflora x Officinalis: The whole picture is too long to give, and my early records too incomplete. I have taken enough notes to give a fair picture - using several of the different forms of Officinalis --- not lobata which is a different story."

made 106 crosses and obtained 359 seeds averaging 3 seeds per cross of the above.

Professor Saunders crossed Officinalis x Albiflora. He made 43 crosses and obtained 197 seeds averaging 4 seeds per cross. There is a further breakdown in his summary but this much gives a very good picture of how well seeds are made. It is fair to assume that those other hybridizers who have introduced hybrids from this cross had similar experiences.

I have never been tempted to make any of these hybrids as there are so many in the trade already.

LETTERS OF INTEREST

Louis Smirnow writes to say that he is now hybridizing. Dr. Raymond Scheele is working with him. He mentions having obtained seeds from a cross between '**Yellow Heaven**' (Ito) and tree peony '**Spring Carnival**'. The direction of the cross was not given, but I suppose the tree peony was the seed parent.

He also mentions having foolishly sold out on the species *daurica*, *obovata*, *pubens*, *willmottiae*, *coriacea*, *macrophylla*, *emodi*, *humulis*, *russoi-reverchonii*, and *woodwardii*. He can't find them again, even in Europe. It is depressing to know the peony is coming on such bad times.

He even lost '**Oriental Gold**' in the winter of 1969. This was his own introduction. He would like information as to where any of these might be obtained. Dr. Scheele would like to get '**Anthem**', '**Ballerina**', '**Eclipse**', '**Good Cheer**', '**Moonrise**' F2, and '**Nova**' for hybridizing. I was able to chop out a piece of '**Eclipse**' for him, but he hasn't been able to locate the others.

THE PEONY CALIFORNICA.

Chris Laning is baffled by the behavior of his plant of *P. californica*. Here is his account.

"The californica plant is a strange one! It came up in February, grew many stems to the height of about four inches and then did nothing more. It can take the cool weather, does not prosper. In July the tops disappeared. To thoroughly confuse me, it started growing again in the latter part of September. Do you think I should dig it up and grow it indoors? Also, along with the root, Miss Saunders sent nine seeds of Californica. These were planted in a pot and three came up. Exactly the same thing happened to them! They died down in July and are now growing again indoors. Do you suppose they are winter bloomers in the land from where they come, California?

This mid-summer dormancy and autumn regrowth sounds something like the habit of the Oriental poppy and the Madonna Lily. Do you suppose this plant is so specialized in adaptation to a Mediterranean type of climate that it just can't be grown successfully east of the costal range?

P. CALIFORNICA ----received roots from Miss Silvia Saunders and some seed, about 3 years ago. Very early, pale bluish-green very incised leaves - very low plant not more 4 to 6 inches. No bloom - leaves remain green in April, May and begin to dry up in June -- are completely gone by July and plant disappears. Seems to be a very weak and delicate grower for me. If the fall is warm and moist it reappears again and grows until frost. Seedlings have same constitution and I do not believe they will long survive.

In 1942 to 1949 Brown made a study of the various colonies of *P. californica* in its native habitat in the mountains of California, ant found at least 10 to 15 separate "colonies" of the species. When the chromosomes of these various colonies were counted, they were found to have varying chromosome counts for the separate colonies, all the way from 5 (diploid count) to 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20. This extensive study is most interesting as it shows that the chromosome count differed and increased as the colonies of *P. californica* spread from the supposedly original diploid center of origin. It is genetically most interesting as it shows irregularities in chromosome counts by chromosome fractures in the centromere, with both losses and additions of individual chromosomes. The same thing genetically is evidenced in P. lutea hybrid '**Alice Harding**' and other similar hybrids. See the article in the Peony Bulletin on P. Lutea Hybrid '**Alice Harding**' -1969. It is interesting that the conclusions in this article scientifically correspond to the extensive work of Brown and his conclusions. That we should expect many other irregularities of chromosome counts in other hybrids and even in isolated species should be the expected norm and not the exception. Brown's work is highly technical but most interesting to the scientific geneticist.

The chromosome count of *P. californica* that was sent out by Miss Saunders to my knowledge has not been counted and could be any one of the many variants. It may well be that *P. californica* with different counts has somewhat different habits of growth and accommodation to slightly differing climatic conditions.

It would be most interesting if several forms of the species from various parts of the State of California and the West Coast could be collected before it becomes extinct, as it is most certainly on its way to extinction without ever being properly tried and hybridized. Some concerted effort should be made to obtain many of these plants, to be tried in several climates. The leaf habit and fleeting nature of *P. californica* is interesting but unless it can be made to bloom and worked with, it will be a total loss very soon.

(Rev. John L. Fiala)

I would be interested in corresponding with any West Coast hybridists who would have *P. californica* available.

TETRAPLOIDS BY MUTATION

A mutation is usually the result of a change in gene structure or chromosome sets in a cell. It is not the result a new gene combination. There are two kinds of mutation. One is caused by x-rays or cosmic rays, chemicals or temperature changes. This causes a change in gene structure.

The other is caused by chemicals and temperature change resulting in changes in the number of sets of chromosomes in the cells. It inhibits the normal development of cell division and this results in the number of chromosomes increasing in a cell.

The usual chemicals used are naphthaleneacetamide and chloroform. The naphthaleneacetamide can be purchased from the Chemical division of the Eastman Kodak Company. A few crystals are put in a bag and tied around a plant stem or leaf. The sunlight and moisture of the leaf will cause it to vaporize and be taken into the plant.

Chloroform is used in somewhat the same manner on the buds.

We will discuss radiation to produce mutations. Ideally a large x-ray machine is the best as you can radiate seed (sprouted) and seedlings. This will give you results sooner than pollen radiation. The dosage should be between 3000 - 8000 Roentgens. Radiate the seeds or seedlings for a minute or less. With experience , you will be able to tell which is best.

If one has access to a machine or knows a technician this is feasible. However, since most of us don't have an x-ray room in the house, the next best thing is to purchase a shortwave lamp.

We first learned about this from Mr. Sam Wissing, a dedicated peony hybridist. He had a display at the Peony Convention in Milwaukee, Wisconsin. He had been using a shortwave lamp for a number of years. He would spread the pollen thin as only the surface was radiated. The shortwave lamp does not emit deep penetrating rays.

We radiated pollen for 4, 5, 6, 8, 10, and 11 minutes. The seed's production was the best at the shorter exposure time. This also produced results in mutations.

Since it is a slow process, we will have to wait to see them bloom. Sam Wissing mentioned he had three color breaks in 1969. He also noted foliage changes in seedlings that had not bloomed. In 1970 he hoped to bloom 10 more treated. Here is an excerpt from his letter: "This year 3 plants of 21, all of the same breeding bloomed, all treated with the short wave. All three were color breaks from this type breeding. One was orange, one cream yellow, one brick red. Next year (1970) at least 10 more will bloom and I am looking forward to seeing this, as the foliage has indications that something has taken place, it is crinkled moderately, some extensively, some normal color, some very deep blue green. This same cross of the same two parents, without any radiation of the pollen, produced a set of seedlings, all very ordinary, blushes, and whites, pinks, the same old thing which we already have in abundance.

Unfortunately, ill health prevented further correspondence. The peony lost a devoted hybridist with the passing of Sam Wissing.

We obtained our lamp for radiation of pollen from E.H. Sargent Welch Scientific Co., 9520 Midwest Ave., Garfield Heights, Ohio, 44125. Be sure to specify that you want a lamp with an emission of less than 3100 ångström units. They have a wide selection of ultra-violet lamps. A long wave ultra-violet lamp will also work. Do take precautions when radiating pollen. Protect your eyes as well as the rest of you. Happy radiating!