THE PEONY NEWSLETTER
For Beginning Hybridists and Advancing Hybridists

Volume 1, No. 1. April 1970

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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THE PEONY NEWSLETTER

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. There is much basic information all of us should have contained in this book. It is a "must to begin with."

1970 Annual Meeting and Show

Roy Klehm, Chairman of Arrangements for the 1970 annual Meeting and Show to be held June 13th and 14th, announces plans are being completed for staging the Peony Show in the Garfield Park Conservatory, Chicago.
Meeting and banquet will be held in Henrici's O'Hara Inn. The Inn is located near the O'Hare Airport and is mid-way between the Conservatory and Klehm's Sunburst Farms where all the activities will be held, on Sunday the 14th.
Roy states buses will be provided to transport members arid immediate friends to the Farms where the Klehms will host a barbeque at noon. Hay rides through the peony fields, and field demonstrations by Nursery crews, are a part of the plans for the day. This promises to be a gala occasion. *Taken from Peony Society Bulletin.*

PRESIDENT'S MESSAGE

The first hybridist newsletter is airborne. May this sheet have fair flight under its able Captain Roy Pehrson. May the same good come to this letter that we pray may come to the hybrids it celebrates; that they will live to become illustrious ancestors, and see their descendants flourish and be beautiful. Bountiful harvest is my wish and hope for all of you.

"Some tell, some hear, some judge the news; some make it." I hope that eventually you will all make news with your contributions to the peony. *By Miss Silvia Saunders, President, APS.*

INTRODUCING ROY PEHRSON

There is only one good reason why a newsletter of this kind should be started, and it is a compelling one. The peony, as we know it, can be greatly improved!

If this premise is accepted by each of you, the total number of seedlings grown will establish the overall rate of progress. Each of you, no matter what the scale of your individual effort, will by adding to the numbers, make steady progress certain.

For the quickest overall results, information must be freely and quickly shared. If all of you cooperate, an informal newsletter should accomplish this purpose effectively.

I'm assuming for the present, the role of what Don Hollingsworth has called, "the Reference Person." Let it be understood, that I am not to be considered the expert, or even an expert on the subject of peony hybridizing. I am merely one of the very few "least inexperienced of the present day crop of hybridizers. I am Roy, and this is enough.

There may be little or nothing of entertainment value in this letter. Each of you will be asked to contribute money to pay for the stationery, postage, etc, used in sending this newsletter. We are asking for a contribution of $2.00 from each of you. Will you please send this to Don & Lois Kozak, 3901 Harvard Drive, Willoughby, Ohio, 44094. Will each of you please do so now. Several people have already contributed enough for the first newsletter.

I don't see any serious flaws in this scheme. If the first newsletter receives a favorable reception, I believe that a very lively dialog will develop. Thus, the interest will continue with each new issue. I am likely to contribute most of the material in the first few editions. This should change rapidly as we have many competent people on our list. I shall never feel very comfortable in this job. I am eager to get it underway, only because I feel that nothing but a strong hybridizing program will bring about a resurgence in the public’s acceptance of the peony, thus creating an assurance that our Peony Society will continue to exist.

Some of you will want to hybridize just for the fun of it. This is surely as good a reason as any. If much of what may appear in this letter seems to be addressed, to a more grimly determined group, please don't run away. You will surely be helped by it.

GOALS AND OBJECTIVES

Miss Silvia Saunders has been most insistent that at least one mailing go out before the peonies bloom this summer. She feels that at least a little advice should be given concerning crosses that should be tried. A few such suggestions will be given later in this letter. First it seems appropriate to give a little space to a discussion of goals.

A. What is the peony like right now?

B. What change in it might add the most to its appeal?

C. How might this change be accomplished?

Let's consider the first question. *P. lactiflora* is the unchallenged king of the herbaceous peonies. Its vigor and. general "garden dependability" as compared with all other herbaceous species guarantees that it will not be dethroned.

P. officinalis is second in line. It has been cultivated intensively enough for several distinct cultivars to have evolved form the original stock. It cannot compete on equal terms. *P. tenuifolia* will also survive in most gardens. It too is not a serious contender. All other species are even less dependable than the poorest of these three.

P. lactiflora possesses only two colors; white and a red, which due to a particular kind of soluble dye, is somewhat purplish in cast. Breeders have nearly exhausted the potential for variation in this red color and its dilution with white. No totally new colors have appeared by reason of spontaneous mutations. It should be obvious by now, after millions of lactiflora seedlings have been bloomed, that the potential for variation in pure lactiflora has been pretty completely exploited. It should also be obvious that if other novel characteristics are to be "borrowed" from other species; the resulting hybrids should still remain essentially lactiflora. Its traits of garden dependability must be retained.

Since lactiflora has only white and purplish-red for colors, I am sure the immediate change should be to introduce other colors. Yellow comes first to mind as *mlokosewitschii* has yellow petals. Some clones of lobata also contain a soluble yellow which blends with its purplish-red to create scarlets, salmons, etc. These are totally lacking in lactiflora. Other colors are possible too, but will probably be obtained much later. For the years ahead, we should direct all our efforts toward obtaining big quality type lactiflora blooms of yellow, orange, scarlet, and salmon.

How may this be done? We shall have to try every approach that holds some promise.

Mlokosewitschi and Lobata, as stated, do have yellow in their petals. These two should be used as basic sources. There is indirect evidence that several other herbaceous

species may also contain a hidden factor for yellow. For the present, we will only consider the above two species separately.

LOBATA

Several of the older hybridizers, but notably A. P. Saunders, used this pollen on lactiflora to produce a series of differently colored hybrids. No other inter-specific cross will make seeds so easily. All the seedlings show those good colors. All of these are triploids, hence almost completely seed sterile. Some produce small amounts of pollen which is viable enough to be acceptably useable. This pollen sets seeds when back-crossed on lactiflora. From this point on, the evidence becomes a bit more tenuous.

Judging from the seedlings I have bloomed to date, the following statements should be approximately correct. The plants resulting from this backcross will look like pure lactiflora. The blooms will have lost the colors of the pollen parent. All are apparently diploids and fertile. Most of them seem to grow and increase quite well. Some, as is the case with my own best seedling, '**Lullaby**', may be extremely attractive. Since they differ so slightly from pure lactiflora, they are not what we look for. Some may contain well concealed; the yellow factor from lobata. They should be re-crossed with their parent plant as well as intercrossed every which way.

MOONRISE

There is one lobata hybrid which behaves very differently. This is the F2, '**Moonrise**' which is tetraploid. '**Moonrise**' is seed-fertile with an abundant amount of viable pollen. When its pollen is used on lactiflora, big fine looking seed pods are produced. Disappointment comes at harvest, when almost every seed is hollow and useless. On the average, only about one good seed per pod will be found. Nevertheless, this cross is highly recommended to anyone having enough lactiflora blooms to use. The resulting seedlings are very distinctive and convincingly hybrid in character. Some interesting selections should come from this cross. I have bloomed two of these; but while these are not quite outstanding, they clearly show that this is a most promising cross. They are triploids with poor pollen.

Lobata has been used to produce only one other strain of hybrids. These are the Saunders "Little Reds" produced by crossing lobata and several forms of double officinalis. They are tetraploids and fertile both ways. If these were crossed with lactiflora, the seedlings would probably include the same type of color as the Saunders lobata hybrids. They would be sterile triploids. The tendency toward doubles would be much higher. They could be used in further breeding in the same way as suggested for the Saunders lobata hybrids.

Yellows probably won't be easily obtained by combining lobata with lactiflora only. These should also be combined with the line of hybrids having *mlokosewitschii* blood in them.

MLOKOSEWITSCHII

This, of course, is yellow; a light but very nice distinct color. It is a diploid, with excellent pollen, which is accepted by only a few other species. It is not easy to prow. If you should try to grow it—and fail; don't be too discouraged. A number of hybrid strains and isolated individual hybrids are in existence. It is these that will probably be used most to recover yellow from the Mloko genes they contain. Some of these are:

1. '**Claire de Lune**' (lacti x m1oko)
2. The "Quad" strains (containing the bloods of four species)
3. The '**Roselette**'-'**Rushlight**' strain (triple hybrids with lacti, mloko, and tenuifolia)
4. The '**Gwenda**' - '**Nosegay**' strain (Mloko and tenuifolia)
5. The Mloko-macro group including '**Nova**' and Saunders 4710 and 9037, Emodi-Mloko, Veitchi-Mloko, 'Belinda' (peregrina-Mloko) and '**Nancy**' (officinalis-Mloko-macrophylla).

This last is obtainable from Allen Wild, Sarcoxie, Missouri. It is fertile both ways. In the "Head start" package you more than likely have something from among groups 2,3, 4, and possibly 5.

You cannot hope to start all at once on a large scale program. You will probably not have enough hybrids and odd species blooming to do this. Do cross all hybrid blooms in any fashion that appeals to you. Use some lobata types onto those containing Mloko. Use pollen from your hybrids onto lactifloras. Our future peonies will have one half lactiflora or more in them. Some of your hybrids will be triploids and will probably make no seeds.

There will come a time when any thoughtful breeder will start to abandon the use of his purchased lactifloras to make room for hybrid plants of his own. These will be more useful because of hidden genes from other species, and desirable lactiflora characteristics.

I bloomed, my first hybrid seedlings as recently as 1967. There were only nine of them. Among these few, there are several plants that should be promising as breeders. I'll describe a couple of these and tell you why I think they could. be better than lactifloras for me.

LACTIFLORA X SMOUTHI

This cross is quite easy, but in this first try I succeeded in growing only one seedling. It is a tallish Jap of a conventional pink color. It locks typically lactiflora in every respect of habit and reliability. It is a good seed maker. I prefer it to a pure lactiflora.

Only one seedling of lactiflora x Mloko has ever been grown, Claire de Lune. We want more of these but the cross is very very difficult. Now Smouthi is one half tenuifolia. Tenuifolia itself crossed with Mloko with relative ease. My seedling is, of course, one fourth tenuifolia. Logically it nay be supposed that it might accept Mloko pollen more easily than lactiflora does.

LACTIFLORA X "QUAD"

There were six of these, Four were semi-double and very tall. They were destroyed. Two, at first blooming were red Japs, very small. One of these later proved to be a modest sized perfect bomb-type double, a good seed maker. The foliage is wholly non-hybrid in appearance. It is rather short in stature and makes no lateral buds. It is a very fast growing and showy plant already. Perhaps, this one plant can be crossed again with Mloko. or with Mloko x macro, hybrids and others. I'll try it.

LACTIFLORA X LAURA MAGNUSON

There were only two other seedlings in 1967, these from this cross. One of these became my '**Lullaby**'. It is so completely double that it cannot be used in breeding. It completes the story of 1967. Mentioning it may provide an incentive to some of you. It is a completely enchanting peony which should be able to make its way in the world.

Do not suppose that you can get one good peony from each nine seedlings. This was beginner's luck. A.P. Saunders named about one in a hundred. I think we should now hope for about one in two hundred. Our standards should be progressively raised, if we are to succeed in the superseding those peonies now in commerce. We should introduce nothing which is merely just as good as something already available.

Nine-hundred and fourteen seedlings, if all survive the winter, will be in their fourth year this summer. Some very good breeder plants should be among them. It is hoped that some day there will be some distribution of the more promising ones.

A startlingly different group of hybrids were brought by the Cousins from Canada to the Mansfield show last summer. Silvia has dubbed them the "Inner Glow" hybrids. The March Bulletin of the Peony Society will have an article on the Cousins, their peonies, and method of crossing their hybrids. Distribution of these plants will surely result in a "quantum jump" in peony breeding,

One of you writes to ask, "Why is it that when Mloko. is crossed with tenuifolia , the hybrids are tetraploid?" Actually, our questioner is not quite correct in the wording of his question. The Fl generation from this cross are actually triploids. It is the F2 plants such as '**Gwenda**' and '**Nosegay**' which are tetraploids. This is clearly explained in Wister's book The Peonies. It is also covered in any competent text on genetics.

It is the first of these two events which can be more puzzling; why two diploids, when crossed should have polyploid offspring, in this case triploids. Some texts on genetics do make some mention of "undivided gametes". It is little emphasized, but rather interesting to discuss.

I will leave out all the details of meiotic division as this can be quite confusing to those starting out in genetics.

DIPLOIDS TO TETRAPLOIDS

Diploid peonies have 10 chromosomes in each of their millions of somatic cells. Only half this number (5) go into the fertilizing cell in a pollen grain or into the egg cell in an ovule which becomes the seed pod. The union of these two sets of 5 chromosomes produces the embryo in the seed. This embryo grows into a new seedling plant. This contains all 10 again.

The process which places those 5 chromosomes in, for example, the pollen grain is not a simple splitting in two. Several divisions with intermediate reduplications are involved. Actually, this results in each pollen mother cell producing 4 pollen grains. Each of these contain not only the 5 chromosome unit involved in fertilization, but other elements as well. As the sequence is complicated, it is understandable that occasionally something may go wrong. The second of the two meiotic divisions may fail to be completed. In this case there might be produced from each pollen mother cell, only two grains containing 5 chromosomes each and another with 10. If this "unreduced gamete" should combine with a normal one in the ovule, a triploid seed would result.

It is believed that this happens once in a while among all higher plants. Ordinarily such events might never become known. Such freak pollens probably can't usually compete with normal ones. Since no diploid seedlings of tenuifolia x mloko are known, we are probably on safe ground in assuming that the cross is normally impossible. It becomes possible only when a double gamete is involved. This can be explained, but I shall not do so here.

An interesting parallel to this cross is the one between Mloko and macrophylla. Very few seeds are produced, but all of these are tetraploids in the F1. They are fertile. Can you now see why this is so?

At first thought, we might guess that Mloko is particularly prone to produce unreduced gametes. Does the above description explain why this is not necessarily true?
The December 1968 Peony Bulletin has an excellent article on Hybridizing for the Beginner, as well as other helpful topics. Do read it!

It is not going to be easy to know just what to write about to make this letter useful to all of you. Some of you have a considerable amount of experience in hybridizing; others none at all. Ask questions! Above all, don't hold back because you may fear your question is too unsophisticated. The purpose of this letter shall be to help, not impress. Make contributions based on your own experiences.

Above all, make an many crosses as you can! As a rough "rule of thumb", figure that each cross will eventually give you one new plant. So make plenty. If you can't use all the seeds you make, give them away. Become enthusiastic. Induce others to hybridize too. Above all, do have fun!
Roy Pehrson

RECORD KEEPING

As you start your hybridizing careers, RECORD KEEPING IS AN ABSOLUTE MUST. Number all the peonies in your garden, plant by plant. Write down their names and assigned numbers. Leave nothing to memory! If you have, for example, two or three of the same plant, number each one separately. This way you will know which plant you used in crossing. Do keep a record of your crosses, seeds obtained, seedlings, etc. Date your records as to month, day and year.

If you have the time, make duplicate records or cross index them to prevent confusion if your set should become lost. Try to keep your records as accurate as possible. This will help you to go forward. You will know by your records where you have already been in peony hybridizing.

Since you will all be sharing your experiences and knowledge, won't you help us find a suitable name for our Newsletter? Please send your suggestions to Roy Pehrson, Lafayette, Minnesota, 56054. These will be printed in the next Newsletter and subject to popular vote. The person who submits the title chosen, will receive 50 or more hybrid peony seeds from Roy.

Our mailing list was compiled from the people answering Silvia's questionnaires. Several of you were not on this list, but are receiving our first letter. You are welcome to join our round robin group. Please let us know whether or not you wish to continue receiving the Newsletter.

Happy Hybridizing!
Don & Lois Kozak