PAEONIA

Volume 4, No. 3 September, 1973

REQUIRED READING –

1. "The Peonies" by John C. Wister, $3.50 from American Peony Society.

2. The Bulletins of the American Peony Society.

The PAEONIA is authorized by Miss Silvia Saunders.

Our leader and teacher in hybridizing is Roy Pehrson.

Editors are Chris and Lois Laning,
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DACTHAL

by Roy Pehrson

Previous to this past season, I had never used a pre-emergence herbicide in my peony plantings. I had just never seemed to get around to doing it during the weekends when I was home.

This past spring I obtained a 50 pound bag of Dacthal and applied it at about the recommended rate immediately after a good cultivation with the tiller. This was the granular formulation. It is also available in a soluble form for spraying. I don't remember just when it was done, but the peonies were well emerged but with growth not very far along.

It was a wonderful labor saver. I did not use the tiller again on these areas the remainder of the summer. There was no harm at all to the peonies.

I guess I had never appreciated just how much of a nuisance the annual grasses had been in the past. Bristly foxtail, green and yellow foxtails, crabgrass and giant foxtail had been the worst offenders, in about that order. They were almost perfectly controlled, though I now find a plant of crabgrass here and there. Pigweed has always been quite a pest. None at all showed up for at least six weeks, but then a "second" germination appeared along with some purslane. Not wanting to destroy any effectiveness which might still remain, I did not till again. Instead, keeping a hoe very well sharpened with a file, I just shaved the now pretty well packed surface. It was not a big chore. Obviously Dacthal does not have full season effectiveness against all annual weeds, but I am very well satisfied, I have never had so clean a peony patch, though my battle with quackgrass must still go on.

These are the weeds which were controlled either very well or completely. The annual grasses mentioned, pigweed, lambs quarters, purslane, shepherds purse, dandelion (seedlings), ragweed. It did not do so well with prickly lettuce, but I think it's possible that there may already have been small germinated plants of this, close up in the rows at the time I applied it.

I am sure there are other herbicides which would work well. The big chemical companies are very competitive in their research, for the farmer market for these materials is an immense one. If I should have any difficulty obtaining Dacthal any time I probably would try either Amiben or Treflan, for these two are used in very large quantities by the farmers in this area.

Some of you may have experience with these or some other materials. If so, won't you please give us an account of your results? …Roy

SELF – INCOMPATIBILITY

Roy Pehrson

Self-incompatibility is something which needs to be of no concern to one who is hybridizing peonies, since it occurs only in pure species plants, and possibly only in those plants which are nearest to the true "wild" condition. It WOULD be an annoyance to someone who has a species plant which he would like to increase faster than would be possible by division of the plant he has.

Because of the relative unimportance of self-incompatibility to us in our activities, this treatment of the subject will be very superficial. Anyone with a real wish for a more complete understanding of the subject will read about it in his favorite textbook. I don't know where the best treatment of the subject is to be found. In his "PRINCIPLES OF PLANT BREEDING" (John Wiley and Sons), the author R. W. Allard devotes nearly six pages to this topic; enough to give a fair treatment of this rather complex subject.

The reason for the existence of incompatibility is of course to prevent inbreeding in those kinds of plants which have evolved this method. Several thousands of species of plants are known to prevent inbreeding by incompatibility systems and very many more have not been tested. There are also many kinds of plants which suffer no harm from inbreeding, and in some of these self-pollination is the normal method of fertilization. The tomato is just one example. Then there are plants which defeat the possibility of self pollination by having flowers of such elaborate construction that selfing by any means is impossible, but still permitting crossing by insects or other vectors. Still other methods are known.

It could very well be that the peony is one of those plants which has been studied for incompatibility. Since I don't know about this, if true, I shall just assume that the system used by the peony is the one termed the "gametophytic" system. The following is lifted bodily from the Allard text: — "In this system incompatibility is controlled by a single gene, S, which is usually characterized by the very large number of allelic forms in which it exists. In the gametophytic system, pollen tube growth is usually very slow in a style that contains the same allele of S; consequently plants are virtually always heterozygous at this locus. The situation of two alleles with gametophytic control and no dominance is, of course, impossible because all plants would be incompatible and the species sterile".

Now for the purpose of illustration let us make an assumption. Let us guess that the species *P. mlokosewitschi* possesses 20 alleles of the incompatibility gene S. These could be denoted S_1, S_2, S_3, S_4 $\cdots$ S_{20}. Now let us say that the clone we may happen to have has the first two of this series. Since both the style and the pollen tubes would have the genes S_1 - S_2, pollen tube growth would be very much slowed and fertilisation would seldom occur, even though the receptivity of the egg cell is in no way reduced by the existence of those incompatibility genes. If we should now purchase another plant of *P. mlokosewitschi* to cross with the first one, what might happen? There are several possibilities. First of all it could happen that the new plant is just another division of the same clone that we had before. This could happen even if we purchased it from a different supplier. The two plants would not really be different plants at all and crossing them would be no better than before. With a little luck we might get a different clone; say one with the genes S_1 – S_3. If we were to cross this plant with our former one, the pollen tubes with the S_1 genes again would not get through but the S_3 genes would. We would then get a half-crop of seeds. Half of these would be S_1 – S_3 and the other half S_2 – S_3. These siblings in turn could be half fertile if intercrossed.

If the new plant we have just purchased,, instead of being $S_1 - S_3$ should happen to be, say $S_5 - S_{16}$ our two plants would now be freely interfertile just as in a colony of plants in the wild.

Just for fun we should consider yet another possibility. What if our proud owner of the $S_1 - S_2$ plant (or any other) should be an obstinate type and. think to himself, "I'm gonna wait for the few seeds I will get from this plant and develop my own freely fertile strain from it. Well, it COULD be done. The few seeds from self pollination should be $S_1 - S_2$, $S_1 - S_1$ or $S_2 - S_2$. The two last of these should intercross freely but nothing else would work. He could mix all his pollens to discover those plants which would set seed. The old mama plant would, of course, be as poor a seed maker as before.

To get a freely fertile strain, where all plants would seed generously would require more than just those two incompatibility alleles. Allard puts it this way: — "Regarding the cross compatibility of sibling matings and general cross compatibility in a population, all that need be said is that with triallelic control only half the matings are compatible, whereas with multiallelic control, cross compatibility rises rapidly as the number of alleles increases, exceeding 90% with five or more alleles. All the incompatibility systems are therefore efficient at preventing selfing, and the multiallelic systems in particular are seen to be efficient at allowing all or nearly all plants, even in small populations, to set a good crop of seed."

As stated at the beginning, unless for some reason you should wish to propagate some rather rare species more quickly than can be done by division, then this discussion has no practical implications for you. It may however assist you in understanding just why it should be that your plant of mloko, of lobata, or of some other species, makes seeds so very poorly to its own pollen. Incompatibility should never be confused with sterility in its many forms. The two things are not synonymous at all.

Editor's Note: In "THE PEONIES" by John C. Wister, see page 52 - Albiflora x Emodi.

PEHRSON'S PROBABLE POLLEN PROBLEM

Roy Pehrson

I would like to tell about an experience I had with *P. mlokosewitschi* this year. I have suggested elsewhere that mloko makes a self-set seed or two only infrequently. Other pollens I have tried on it have not worked either.

Some years ago Silvia sent me a wisp of a plant, saying she did not know for certain what it was. She had been calling it "pink" mloko. I planted it sort of in the shade of a large peony clump hoping to nurse it along to a better size if it should have a will to grow. The plant has lived, but has been very slow to increase in size. This year it had a single small bloom. Looking at the small plant for several years it seemed to me that the foliage was almost identical with that of mloko except that the leaves were distinctly wider. I wondered if it might be the plant described in "The Peonies" as *P. daurica* or *P. triternata*. This plant is said to be very closely related to mloko and to be completely inter-fertile with it.

I could not be very confident of this identification for the reason that Silvia herself had taken a picture of *P. triternata* for "The Peonies". Nevertheless, when that bloom appeared I used its pollen on most of the blooms on my plant of mloko. The result was very good. I got 29 very nice seeds. Three or four blooms not pollinated gave nothing.

I think I shall now have to believe that this plant should be called either *daurica* or *triternata* depending on whose system of nomenclature is accepted.
Sorry 'bout that Silvia!

Editor's Note: - Roy, I suppose you will call it what you wish but I believe your *daurica* is *P. mlokosewitschi.*

I have one *daurica* and one mloko and they don't look alike. You just can't confuse the two! Miss Silvia is right.

Sorry 'bout that!
* * * * * * *
Mr. Dara Emery of Santa Barbara Botanic Garden sent me a packet of *P. mlokosewitschi* seeds which were obtained from U.S.S.R.

These seeds were received in May or June. I planted all of them and find that some of them are rooting. Will they produce yellow flowers — set good seeds?

WHAT IS PAEONIA MLOKOSEWITSCHII?

(From an unidentified garden magazine)

According to the late Sir Frederick Stern's invaluable STUDY OF THE GENUS PAEONIA this distinctive species was discovered by Mlokosewitsch in the eastern central Caucasus in 1900. It grows in a very limited area. The specific name is a little difficult to pronounce and some gardeners prefer to call it, most inappropriately "mossy whiskers".

It is one of the few species with yellow flowers, and distinguished from the rather similar *P. wittmanniana* by its much narrower leaflets. The leaflets of *P. mlokosewitschii* while having a tapered base, broaden out and are bluntly rounded towards the apex, with usually a very small pointed mucro. They also have a distinct, attractive, coppery tinge when young.

I first saw this splendid plant in flower at the Birmingham Alpine Garden Society show in 1938. In December of that year a plant arrived from the exhibitors, the firm of Bowell and Skarrat. Those who believe that nurserymen today are not what they were will receive confirmation of their view when I mention that in my notebook it is recorded that the plant had 16 "snouts" (growth buds)!

It was said to be a peony that would do well in light soil, and this proved to be so. It flowered in the first days of May -- rather paler than the original plant seen.

My plant produced masses of quite startling vermilion seeds — or so I thought. These were duly sowed. Nothing came up. I discovered later that these were infertile seeds; the fertile ones are plump, rounded and glossy purplish black. The effect of the pods, with this mixture of colours, is one of the pleasures of the plant, and is a characteristic of other peony species. The pods burst open in late July and remain decorative until well into September.

This peony became very popular but has become very difficult to obtain. My own plant produced seed only intermittently, so I bought a packet of seed offered by a well-known firm. Seedlings came up well. I noticed that the upper surface was hairless while on my plant it was somewhat downy — otherwise, it was typical.

When they eventually flowered, the colour was surprising. Instead of yellow it was white, flushed in varying degrees with crimson, veined also with that colour. No reference that I could find mentioned any colouring other than yellow, which indeed seemed to be one of the distinguishing features of the species. However, the showy fruits were duly produced and later, self-sown seedlings appeared which have not yet flowered.

In the meantime, I had sown seeds from a known true yellow. In 1967 they flowered. One had small crimson flowers — a considerable surprise. The others were creamy, in some cases margined with pink. The foliage was typical.

Is this a usual happening? I have not seen it mentioned. Are a number of "mossy whiskers" now in cultivation, not the real thing, but hybrids?

The only reference I can find to hybridity is the account of the long series of breeding experiments made by A. P. Saunders published in THE NEW FLORA AND SYLVA of July, 1933. Working with 31 species (some are not now so regarded, though they differ from the gardener's point of view), he was only successful – and then in several cases with difficulty, in obtaining *P. mlokosewitschii* crosses with lobata '**Otto Froebel**', *macrophylla, tenuifolia, triternata, woodwardii, anomala* and *arietina*. From none of the resulting plants had he been able to obtain seedlings. Perhaps some readers may be able to throw light on this interesting problem.

Editor's Note: - Mloko x tenui and mloko x macro crosses have produced seedlings — making the quads possible.

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PAEONIA LOBATA

Roy Pehrson

All peony hybridizers are probably familiar with the account of the wonderful success Prof. Saunders had with the use of the plant of *P. lobata* which he obtained from Amos Perry of England. These hybrids are all characterized by a warmth of coloring which had not been seen in any hybrids previously. They are much admired and much wanted as a consequence.

Saunders had used other plants of lobata too. One of these, No. 5267, he described as a deep crimson in color. A good many seedlings were grown, but with much less success. The very few selections made were not like the others in color.

Miss Saunders has stated that the original Perry clone no longer exists. This would be unfortunate for hybridizers if the Perry plant had been totally unique. It is now certain that it wasn't.

Several years ago hybridizers began to believe that the new colors in the Saunders' lobatas was due to a yellow dye which blended with the usual peony red to produce those truer red colors and those fine warm pinks. Fred Cooper extracted the color substances from the petals of a Saunders hybrid and by a paper chromatography test determined that a yellow dye was indeed present. He found it too in the petals of a species lobata plant. This result proved beyond a doubt that lobatas are still available which should be equally as good as the Perry clone. It should therefore be possible to use lobata blood to produce yellow hybrids if only the yellow and

the red could be separated. But before proceeding with this reasoning it should be mentioned that the lobata hybrids produced by Glasscock ('**Flame**', '**Sunbright**', '**May Delight**') show the same yellow influence as those of Saunders. The pollen parent of these is given as lobata Sunbeam. It must be supposed that Sunbeam then also is much like the Perry clone genetically and that this type is not too rare in the species.

To resume the argument, the red color did drop out in the case of the F2-'**Moonrise**'. To my eyes this one is not very yellow, but as it is often called a yellow the color must be present. Breeding results have now shown this as very probable. David Reath has announced a good yellow, one parent of which was '**Moonrise**'. I bloomed about 20 seedlings of the cross "Quad F2 x '**Moonrise**' F2, and among these there were two which were noticeably yellow. One was scarcely deeper in color than '**Moonrise**' itself, but the other seems identical in color to *P. mlokosewitschi*. Then too, the variety '**Prairie Moon**' is said to come from '**Laura Magnuson**' (a lobata seedling) x '**Archangel**'.

These hybrids all involve the use of a second parent which also contains a trait for yellow color. In my own cross, genes from lobata, mlokosewitschi and macrophylla are all present. I shall not here explain why it seems certain that macro has genes for yellow, but I have other evidence which convinces me it is so. The best possible way to get light yellows then seems to be to combine all three species through the use of hybrids which contain them. The advanced generation Quads may be the best of all to use as one parent. There are other good possibilities of course. It is tempting to think of Nova as the best prospect of all, but there seem to be difficulties in using it.

Saunders also made crosses of lobata onto various double forms of Officinalis to produce his four "Little Reds". These seem to have been used by Mr. Cousins in developing his "Inner Glow" hybrids. This fact may suggest a program of breeding someone may wish to try. Aside from the two kinds of crosses mentioned, Saunders appears not to have used lobata in any other crossings. If he may have done so there is no record of it in his "Big" notebook.

There are two excellent reasons why a beginning hybridizer with a reasonably large garden space might like to try the lacti x lobata cross.

1. It is the easiest cross possible. Seed production is very large.
2. The hybrids are all nicely colored and it may be possible to obtain seedlings comparable in quality to those of Saunders.

P. lobata itself may be a little slow becoming established. In addition it does not bloom very early in the season. These facts may limit somewhat the use which can be made of it.
As for hybrids containing lobata blood; well, the possible crosses are almost endless, so try almost anything which comes to mind. Crosses of opportunity have a disconcerting way about them, often producing more interesting seedlings than those which were (intelligently?) planned.
P. lobata also made a nice crop of seeds this year (1973) — 52 of them. I had used pollen of the "little red" '**Scarlet Tanager**' on it. If these should grow well they might make plants which would make good alternate pollinators to lobata for use on lacti. I think I have only two small seedlings of lobata from self pollination.

PROGRESS REPORT - "ITO" HYBRIDS

Roy Pehrson

Chris has found it needful to nag me a little bit to write something about what has happened with these hybrids in the past year. I have not been very keen about the idea because there has been nothing significant. None has bloomed, and that of course is what concerns us the most. We want the flowers to be comparable to the lutea hybrids in quality of bloom so that all peony lovers will want to have them. We also want them to be sufficiently herbaceous in habit — blooming regularly from below-ground buds, so that growers in the coldest areas can handle them easily. Along with this, of course, we would like to hope that there might be a considerable range of variation in flower form and color. Finally, and over the long term the most important perhaps, we would like to find in them at least some slight fertility so that a breeding strain can be established. After looking at stems and foliage hundreds of times over several years one becomes a little sated with this. At this stage only the appearance of some flower buds will bring back the old excitement in full force.

Two of the plants, if nothing disastrous occurs, should certainly bloom next year. A few others may do so too, but these two differ enough from all the rest so that they deserve separate mention. For this account I'll call them "A" and "B". Both of these are more herbaceous in appearance than any of the others.

"A" has increased greatly in size of plant over last year. The rather big leaves on its three stems, a foot or more in height, have made this an attractive clump almost two feet in height. There was one of those tiny pinhead abortive buds on one of these. The medium light green leaves are decidedly of tree peony outline and are softer in texture than almost any of the others. The stems are apparently a bit less woody and have just a little tendency to make an aboveground dormant bud.

"B" has also increased very well in size as compared to last year. Stem quality seems very similar to that of "A". It also had a tiny bud. It too has softish foliage, but nothing at all like "A" in outline. There is only the slightest suggestion of the tree peony shape of leaf, yet its hybridity is unmistakable. It is something like a well constructed teenager trying to disguise herself in men's clothes. The message gets through anyway. This one seems even more herbaceous than the other one.

All the rest of these which have grown big enough to partially evaluate appear to be much of a kind, with strong leanings toward the tree peony pattern. Thus far most of these are much shorter in stem. Some have shown no stem at all yet. Most have made growth from only one to three below-ground buds, but there is one super vigorous plant which has nine very short stems. Finally there are just a few which have not taken hold at all yet, and may actually be weaklings. Time will tell.

I had a bit of bad luck with two of the smaller ones. They were cut off by climbing cutworms — one of them three times, and they finally gave up the effort. I hope they may show up again next year.

Last fall I noticed that one of those of "average" type had made about three dormant buds right at the surface of the ground. Although I did no covering at all for winter protection these buds survived. I lost no plants of this cross despite the near absence of snow last winter.

At a peony meeting a few years ago one of our number suggested that since the Ito hybrids are prone to make buds close up to the soil's surface, that they be planted deeper than other peonies. The idea was to protect these buds. Well, peonies have a remarkable ability to adjust

themselves and they would not accept this indignity. Nevertheless I agree with his suggestion because I think that in adjusting to the deeper planting, the crown structure of the plant would be modified in a way that would make division easier at some later time. Although I am doing this when setting them in a permanent spot I was a little baffled by a nice plant I lifted out of the "kindergarten" row a few days ago. This plant had a whole slew of small buds starting almost at the ground surface and extending fully four inches deeper. I planted it a little deeper than it had been anyway. I don't think it will mind!

This just about covers what has happened with the plants which are more than a year old. Now how about the plants obtained from last summer's crosses?

Well, the whole situation is filled with so many uncertainties that I don't know what I have. At the time in early summer when these hybrids are most easily recognized I thought I was able to identify ten new ones. True, only three of these had that leaf and stem coloring derived from suffruticosa which makes identification certain. Then two of these failed so that I have only one for sure; a seedling derived from pollen of '**Regent**' sent to me by Mrs. Howard of Maryland. It's a nice little plant. Others are very uncertain. There are, for example, about five seedlings supposedly '**Golden Dawn**' x Ludlowi. They may or may not be real hybrids.

Since I may have lost two of the older ones to climbing cutworms and since I may have as few as one or two new ones, it would be best to guess that I still have a total of about 60. The effort will continue.

NEW SEEDLING EVALUATION

Roy Pehrson

Each hybridizer will discover sooner or later that real "world beaters" in a seedling population are quite rare; a "gift of the gods". Consequently he must set his own standard of excellence at such a level that he will have something to save and to look at again from each year's crop. Although no seedling should be named and registered unless it is superior on one or more counts to the most nearly comparable variety in the trade — or happens to be of a new and novel type — such a standard is too restrictive. Many very nice seedlings will come, and who knows; maybe in time something or other will prove to be better than it first seemed to be.

There were a few interesting seedlings this last season, all of which must be looked at again. I'll describe a few of them —

1. '**Mikado**' x '**Good Cheer**'. This from the use of a smidgen of '**Good Cheer**' pollen sent me a few years ago by Silvia Saunders. There are about 20 seedlings; about half of them 4 years old, the rest only 3 years — delayed germination. The single stemmed plant, only four years old had a double bloom. It is hazardous to predict from so young and small a plant, but it could go like this: the flower form seemed exactly like that of '**Red Charm**', but it's hardly likely that it will be as big. The color is a trifle lighter and more sprightly. It may have a little lobata influence to account for this. The stem apparently will be quite heavy and very stiff. The foliage certainly will be much better than '**Red Charm**'. I'm very high on this one, but two more years will probably be needed to evaluate it. If it can not make a place for itself I think it will only be because of too great a similarity to '**Red Charm**'.

2. '**Tokio**' x '**Nathalie**'. A genuine hybrid I feel sure, A rather nice pink Jap on a stem of moderate size, but perfectly adequate to hold the bloom erect. Somewhat shorter than medium height but yet not a dwarf. If the bloom and stem are not good enough to justify this peony, the foliage may tip the balance. To me the foliage is the most attractive in the whole garden except for '**Eclipse**'. A very neat landscape type. Bloomed last year too on a 4th year plant. It is seed fertile.

WINTER PROTECTION OF LUTEA HYBRIDS

Roy Pehrson

Because the winter here in Minnesota, from the first of January onwards, was the mildest in my memory, I have been reluctant to describe how I managed to overwinter the above-ground parts of some lutea hybrid tree peonies last winter. I read through our list of members and found about ten or a dozen who live in parts of the country where there might also be difficulty with winter damage of these plants. Possibly some of these people might be interested in trying the method I used, on the chance that my success was not due entirely to a very favorable winter.

Lutea hybrids appear to be quite root hardy here. They freeze back only to ground level or slightly above. Why, I wondered, should this be so? Surely the soil should get just as cold as the air during prolonged cold spells when the ground is completely bare of snow. Then too, it seemed most unlikely that the roots and crown of these woody plants would possess some sort of factor for greater cold tolerance than the upper parts of the plant.

I suppose there must be some temperature at which these plants are completely killed. Still it doesn't seem to happen here. They winter successfully in the Chicago area and in the Milwaukee area where the winter temperatures are not so very much milder than they are here. It should be possible to devise some method of protection which would overcome this little difference.

I believe that in an area like that where I live there are two things which work together to cause damage. Firstly there is the low temperatures reached during the winter and their duration. When temperatures are the very coldest the air is very dry. The desiccating effect of this must dry the stems very severely, especially when strong winter winds accompany the cold.
I reasoned that if I were to keep the stems completely away from contact with the air it might do the trick. So I acted on this idea.

I bought some of those foamed polystyrene rose cones, not for their insulating value — which is negligible — but because they are of convenient size and shape. I cut the tops out of these, placed them over the plants, and filled them with soil to cover completely the topmost buds. It worked very well! Almost all the stems lived through the winter very nicely. One of my two plants of '**Alice Harding**' had six short stems grown last season from ground level or below. Each of these produced a good bloom. I'll treat these plants the same way this fall and see if it works well again.

There is an interesting sidelight to this. Mr. Ivan Kivell of Greene, Iowa, wrote to say that he used essentially this same method to protect a plant of one of the original "Ito" hybrids. This had a stem four or five inches long. The terminal bud on this stem survived the winter and made a bloom! This happening convinces me more than ever that these Ito hybrids tend more to be woody in habit than herbaceous.

LETTER TO - Mr. Leo J. Armatys, Central City, Nebraska Dec. 17, 1971

Dear Leo:

It has been some time since we corresponded so am writing again rather than sending a Christmas card - though I do wish to send best wishes to you and yours for this Holiday Season.

If you will permit me I would like to express some opinions I have formed about tree peonies, and only about the tree ones as I have none of the herbaceous type nor interest in them, though space in the bulletins would seem to favor herbaceous about 75%. And of course I am a neophyte and have only been a member of the Peony Society for a few months but maybe "out of the mouth of babes .. "

Knowledge -

1. Lack of knowledge of tree peonies. The "Handbook of the Peony, Second Edition Amended" says "At this time there is no book or other literature available to those who wish information about the peony". If the public is to know, grow and popularize tree peonies then pertinent information oust be made available and disseminated. Pertinent information should be the following for all known tree peonies: Cultural requirements, quality of bloom, quality of plant, color of bloom, size and type of bloom, height of plant, time of bloom, floriferousness and ease of culture. This information could be arrived at by questionnaire to all Peony members and those known to be knowledgeable non members. These questionnaires could be returned to some central place for compilation of the returns. I would presume there should be sufficient reservoir of such knowledge to arrive at a fairly good consensus as a start of what a plant is worth. This would be a foundation from which to build and it could be revised and updated from time to time, the information available to the public.

2. Lack of knowledge of propagation by cuttings. Apart from lack of general knowledge by the public is the high cost of tree peonies. It would seem that for these plants to become favorites the cost of them must be lowered. I think this could be done if cuttings were rooted, resulting in mass production and low cost per rooted cutting. Another advantage would be that named plants for cutting stock would result in clones that could be guaranteed true to name. Apparently the Chinese and French a century ago propagated by cuttings and Mr. Ingram reported 98% rooting so it is possible to propagate by this method. If this be so then effort should be made to standardize rooting procedures by cuttings at some selected experimental research station so that the resulting standard procedures would be made publicly available and be quickly put to use. It should not be too long thereafter that a steady flow of lower cost, high quality true-to-name material would get into commercial channels to be made available to the public. If this research station was nearby to a tree peony test garden that supposedly had or would eventually have one or more of every known tree peony it would provide cuttings for experimentation and would guarantee against permanent disappearance of hybrid clones or species — the possibility of which having been deplored by Miss Saunders and Mr. Smirnow. Too, this should give impetus to hybridization — not that this phase of peony culture requires additional help — by more availability of material from which to work.

I talked with a friend of mine, a doctor and rhododendron enthusiast, about your reference to an English correspondent who roots peonies "in vitrol". This doctor suggested that what was meant perhaps was "in vitro" or tissue culture which may be that method of Dr. Murashiege to which I have in the past alluded but of which I know nothing.

This is a long and rambling letter and may be of no benefit but if these ideas do have merit I think in time it would make a great change in tree peonies as I understand the situation to be. Again with best wishes to you and again looking forward to your interesting and knowledgeable letters, I remain,

Don M. Jenkins, PO Box 192, Brevard, N.C.

THE "INTENSIVE CARE UNIT"

Chris Laning

Some peony seeds need extra special care if germination is to be successful and the fragile plants are to survive. While ordinary peony seeds are vigorous enough to produce stout little plants with no extra care, tree peony seeds as well as herbaceous twins and triplets, do need it if success is to be assured.

Let me give you information on the progress I have experienced with some twins that I received from Roy Pehrson. Here is a list of the hybrid twins:

1. '**Moon of Nippon**' x '**Canary**'
2. '**Moon of Nippon**' x F2A
3. '**Moon of Nippon**' x '**Regency**'
4. '**Moon of Nippon**' x '**Regency**'
5. '**Westerner**' x '**Alice Harding**'
6. '**Westerner**' x '**Alice Harding**'
7. '**Shaylor's Sunburst**' x '**Regency**'
8. '**Kate Berry**' x '**Argosy**'
9. '**Kate Berry**' x Delavayi lutea . (this one died)
10. '**Gertrude Allen**' x '**Argosy**'
11. '**Vesper**' x '**Black Pirate**'
12. Reddest Pod - not hybrid
13. '**Red Charm**' x '**Nancy**' – Not a twin and failed to germinate

These twins were in rather poor condition when they arrived by mail. The roots (or hypocotyls) didn't look too good, the season of the year wasn't right for setting them out and refrigeration just could not be continued. A new approach was needed and so the birth of the "intensive care unit"!

The "Intensive Care Unit" is an area within my plastic A frame where bottom heat is provided. Conditions can be controlled to suit the needs of all but the very weakest of seedlings. Watering, feeding, shading and caring for them is a joy within this unheated plastic tent.

To get a better idea of what this article is about, read in the June issue of PAEONlA, Page 9 - Twins and Triplets by Fred Cooper; pages 10-13 of the same issue, Questions and Answers on Twins and Triplets; also on pages 11-13, Seed Germination Techniques. In the September, 1972, issue on page 13, Propagating Tree Peonies from Seed; page 14-, Plastic Covered A Frame.

Do you wonder if the extra work is worthwhile? Well, I do have about 300 tree peony seedlings! Also, the twins have taught me a great deal. So I must say — hybridizing goes forward.

Twins are really interesting; two plants within one seed coat. Possibly you may think of them as Siamese twins; this just isn't so. When checking on them after one season of growth, I find that what I have is two individual plants growing side by side — real twins from one seed. Will they be "identical twins"? Who knows? Will there be a change in ploidy? Will they be the "Ito" type cross - yellow blooms eventually? Will any of them set seed? This is the great anticipation and suspense that makes intensive care pleasurable.

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Roy, just for your information, I'd like to say that keeping the twins alive really takes some doings! I find that one of the stems of the twin is robust and the other is very frail (at least this is true in many cases). Maybe the frail one is a monoploid (or haploid). If this is true, this weak one

is the one of great interest to me. I have read that monoploid on occasion will set fertile seed. According to the genetics article, unreduced gametes are responsible. Now, under these conditions would such a plant be completely homozygous?, or at least, very nearly so? Please give me your thoughts on this! I can well imagine what benefits could be had if the other stem were tetraploid or octoploid.

Last year's plants (twins from you) didn't do too well — only three plants came up and then the weak portion failed to show up; it had died. The surviving portion of each of the three twins looks like pure diploid lacti.

This year's twins from you have been kept in the "Intensive Care Unit" and all but two have survived! Yes, even the frail portions are still green! If you will recall, these plants, because of their parentage, could be real "Ito's". They don't look like pure lacti (albiflora-out) plants so what do you think??

Chris - Yes, monoploids would necessarily be homozygous at every locus. Then if the count could somehow be doubled the resulting diploid would also be entirely homozygous. If self-pollinated seedlings could then be grown from it, these seedlings should be indistinguishable from the parent. Such a plant might be of considerable interest to a geneticist interested in studying inheritance in peonies, but I very much doubt that it would be of any real value to amateur plant breeders such as us. It would take something like a miracle for a plant like this to be homozygous for some fine trait which we would like to impart to a lot of other seedlings. Goodness knows, such fine qualities come along with rare frequency.

Yes, I think there is a possibility that one or more of those twins could be hybrids. If it should turn out to be true it might suggest that twins are more likely to occur more often among these hybrids than in pure lactifloras. Another season should tell you a little more about their leaf form. - Roy

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ABOUT BENLATE

Roy Pehrson

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.