PAEONIA

Volume 3, No. 4 December, 1972

REQUIRED READING -

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

SUGGESTED READING -

1. "Peonies - Outdoor and In", by Arno and Irene Nehrling.
2. "Create New Flowers and Plants" by John James.
1. "General Genetics" by Srb, Owen and Edgar. This is a college level text.

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The PAEONIA is authorized by Miss Paeonia, our Miss Saunders.

Our leader and teacher in hybridizing has been, and will continue to be, Roy Pehrson.

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NOTE TO MRS. JOHN KRANTZ, Brainerd, Minnesota

Don't be too concerned that some twins dried off early. I'm reasonably sure that you'll see these next spring though they would be very small. Sprouted seeds don't establish as well the first year as those planted "normally" and it does not depend much on the habit of the parent in this respect.
(Roy Pehrson)

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"ALL ALBIFLORA — OUT"

This is taken from A. P. Saunders' "Big Notebook". There are many similar entries. He is, of course, referring to the fact that very frequently in using lactiflora (albiflora) (sinensis) as a seed parent in crosses, many or all of the seedlings obtained proved to be not hybrids at all, but pure lactifloras.

In the same notebook he attributes such happenings to "accidental self pollination." In another of his writings he explains this more fully. The following quotation is taken from an article "Some New Hybrid Peonies" written for Bulletin No. 27 of June, 1926, and reprinted in. Bulletin No. 133, June, 1954.

> "Thus, I am pretty well satisfied that I have never had any successes in crossing the various forms of shrubby peonies with any of the herbaceous species. It might seem an easy matter to be quite sure about the success or failure of a given cross, but it is not so easy as it looks. Of course if a cross is made and no seed is obtained it is plain enough that the cross has failed. But if the seed pod enlarges and in the autumn yields seed, it is by no means certain that the cross has been a success. For one must remember that the anthers of the peony often burst before the bloom has opened and consequently there is always a danger that a bloom may have fertilized itself, even though the petals and all the stamens may have been removed while the flower was still in bud."

It must be borne in mind that the passage quoted above was written early in Mr. Saunders' hybridizing career; at a time when he was blooming only his first generation of hybrid plants. It would be very interesting to know whether he may later have begun to have doubts about these accidental self pollinations having come about in just the way he explains them here. I began to be very puzzled about this several years ago.

Over the years my own experience has closely paralleled that of Mr. Saunders. I have bloomed out several thousands of pure lactifloras from supposed crosses and, except for the lacti x lobata cross, have found only a few hybrids. I guess I must admit though that carelessness may have played a bigger part in my poor results, even though Saunders often used single lactis as seed parents whereas I never did so. There should have been less chance of self pollination with the japs, anemones and bomb type doubles which I have used exclusively.

It was only when I started to try to make the lacti x "lutea hybrid" cross that I corrected my previous careless practices, trying by every means I knew to make only uncontaminated crosses.

I continued to use japs, anemones, etc, as seed parents. I chose buds at least one, and often two days away from opening. These were stripped very completely, pollinated and bagged immediately. I feel confident that many of the pollens I used could not have been previously contaminated by lactiflora pollen. My "fingertip" technique is such as to rule out any possibility of contamination at this stage.

In spite of all this I still continued to get seedlings which were pure lactifloras. As the genuine hybrids are very distinctive in appearance there could be no doubts on this matter. Yet there they were! It simply could not happen but still it did! I was completely baffled by now, really desperate for an explanation. I even grasped at the thought that parthenogenesis was involved. This could not be true either since these plants were not uniform in appearance, nor did they resemble the seed parent very much.

This frustrating dilemma continued until this summer when an observation in my garden startled me into the realization that I had an explanation which satisfied me.
I had pulled off all the. terminal blooms on a clump of '**Vista**' which had opened too far to be safely pollinated. When I returned to this plant the lateral blooms too had opened a little too far to be sure that insect pollination had not occurred, so I decided to use lobata pollen on them. This pollen is so effective that I could be sure that most of the seeds would be hybrid anyway. Then I noticed something unusual. About ten of these blooms had tiny yellow nodules or specks of what I assumed to be pollen, located at intervals within the "crease" formed by the incomplete fusing of the two edges of tissue on which the stigmatic surface is developed. If these are really tiny lumps of pollen they are ideally placed to effect the self pollination of that particular carpel on which they are seen.
Beginning hybridizers, and especially those who use a brush to pollinate their blooms, may never have noticed the existence of these incompletely sealed edges at the active surface of the stigma. I notice it occasionally when applying pollen with the fingertip. Sometimes in rubbing the fingertip crosswise over the stigma the two surfaces will be seen to separate. I have seen this only on those varieties which have a narrow, attenuated stigma with a very narrow active surface. '**Vista**' is one of these. I think it is much less prevalent in those more "normal" kinds which have a much broader "easy to pollinate" stigma.

Because the fossil record of soft plant parts is very poor, botanists have not been able to trace the evolutionary steps involved in the development of flowering plants from simpler precursors. It seems clear however that each separate part of a flower has evolved by the modification of a single leaf. This has been accompanied by a shortening of internode spacing almost to nothing. Because the flower parts in the peony are far less elaborately specialized than in many other plants, the peony can be considered a flowering plant of a "primitive" sort. It is comparatively easy to imagine that the carpel and its attached stigma may have evolved from a single leaf of some remote ancestor. Let's do so, briefly. Let's say that a single leaf folds inward along its mid rib and that the edges fuse to enclose the ovules which somehow develop from cells on the enclosed leaf surface. Ripened seeds are released when these fused edges become "unstuck" later. The very tip of this leaf extends beyond the part which becomes the seed box. Its two edges normally fuse also and the stigmatic tissues develop along the line of these fused edges. Only a slight abnormality in development would be required to provide the incompletely fused edges I've described, and between which I believe I saw those small inclusions of pollen.

It is suggested that this idea is not a fantastic one when one considers the other sex reversals and abnormalities which have been seen. In doubling of any degree, stamens and even carpels become petals — a more leaf like form. Stebbins and Saunders (Genetics", Vol. 23, 1938) describe the occurrence of small outgrowths of stigmatic tissues on small atrophied stamens in a hybrid of lacti x Vietchii. Saunders obtained even more startling reversals (multicarpy) in many seedlings between lacti and several members of the "anomala" group of species. In these, the many stamens are changed to a mass of very small non-functioning carpels complete with stigmas. '**White Innocence**' is a perfect example of these. In corn I often see seeds formed in the tassel (the staminate bloom) of the plant.

I believe all the above is sufficient to establish that my conclusion could be correct. It should be tested microscopically by someone with the facilities and the opportunity to do so.

It's not a terribly important matter. Even if it proves to be correct there's still no way to guard against the unwanted seeds. We will still get self pollinated lactifloras to discard but we will understand why it happens.

- Roy

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Editor's Note: -- So there you have it, dear hearts and gentle people, our peers have spoken. So be it, "All Albiflora — Out". But being a novice, I am just wondering if the lactiflora (albiflora) could be completely dominant in all appearances in the seedling while its partner (the pollen parent) gives all the recessives. Then the plant would look 100% lactiflora but actually be a hybrid. Therefore, Roy Pehrson, all your "All Albiflora — Out" plants of the lactiflora x lutea hybrids crosses are of interest to me. Will you give them to me? Or else, keep them until one more observation is made. The check that you could make that would satisfy me is this: does the seedling set. seeds or have viable pollen? If the plants which are to be destroyed or discarded are fertile, I can agree with the whole article and the plants are 100% lactiflora and not hybrids at all. But if they are sterile, I would, question the whole matter. - Chris

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LETTER FROM FRED C. HELMLING, 8050 S. Rt. 88, RD 1, Ravenna, Ohio, 44266.
Chris and Lois Laning, December 5, 1972.

I am sending my check for $2.00 for 1973 dues to "Paeonia". This newsletter is very interesting, and to a beginner like me it is worth more than the price we pay. If it is more than $2.00 a year, please let me know. I think this newsletter is better than a round robin because there are probably many of the 50 or so members that could not join a round robin or contribute much to one.

It might be out of order, a suggestion like this one, but why don't you Directors of the Peony Society award Miss Saunders the Saunders Memorial Medal for creating the "Paeonia"? Many of us may never produce a new peony worth naming, but Miss Saunders' idea of forming this group has created much more interest in improving peonies.

We started trying to hybridize peonies after visiting the workshop in 1969 at Kingwood Center. At that time we had 6 hybrid peonies. Now we have 220 and about 30 herbaceous species.

Last year some of the plants supposed to set seed did not do much. Some produced seed and some of them did not produce any. Strange though, some of the plants that are not supposed to set seed produced a few (more than 1 seed). Sometimes I wonder — we have two colonies of bees, about 100 feet from the hybrid peony patch and it might be that their many trips to ALL the flowers in the patch may pollinate blooms that usually would not produce seed.

We leave all the blooms on the plants and check them in August. and September to see if some of "non-seed producers" have seeds in them. I know Pehrson told me that the officinalis hybrids would not set seeds, but we keep looking. Hat Ha! Might be we should let the bees and Mother Nature do the pollinating!? We bag all the blooms we work on and cut the flowers for pollen and put them in the house to open.

The September "Paeonia" was the first place I had read about freezing pollen. We have frozen some since 1969 and had a few seeds from it. Results may be better after we learn which plants produce the best pollen.

Wishing you both a Happy Holiday Season and the best of everything in 1973. -- Fred

1972 HYBRIDIZING SUMMARY

Reproduced below is a summary of peony pollinations and the number of apparently sound seeds produced in my garden at Kansas City, Missouri, during the 1972 season. The listing includes all crosses made except for some that were broken off before maturing.

The total of surviving crosses was. 367. After discarding "soft" seeds at harvest time and a few rots during first phases of the germination period, the sound seeds totalled 250.

There were 163 different matings, some represented by only one pollination and others by as many as ten, but all made in accordance with various purposes.

In the following tabulation crosses have been lumped together into groups to compare with questions and purposes which I have had in mind. Additional detail of pollen control methods and some of the varieties will be discussed below.

TABULATION OF CROSSES BY SELECTED GROUPINGS
(Seed parent given first, pollen parent last)

	Crosses Using 1971 Pollen From Home Freezer Storage	No. of Crosses	Sound Seeds
1.	Tree Peony (suffruticosa) x Tetraploid Lactiflora (Reath Tetraploid Lactiflora)*[1]	5	24
2.	Tree Peony x '**Good Cheer**' (tetraploid)	1	1
3.	Tree Peony x Delavayi Lutea (strain) Re-bloom Sdlg.	2	6
4.	Early Tetra Hybrids x '**Good Cheer**'	5	2
5-	Early Triploid Hybrids x '**Good Cheer**'	3	0
6.	Lacti x '**Mystery**' (Lutea Hybrid) *[1]	15	57
7.	Lacti x '**High Noon**' (Lutea Hybrid) *[1]	34	3
8.	Lacti x D240 (Lutea Hybrid F2?) *[1]	2	9
9.	Tetra Hybrids x Reath Tetraploid Lactiflora *[1]	13	13
10.	Triploid Hybrids x Reath Tetraploid Lactiflora *[1]	50	0

*[1] Pollen collected from flowers discarded at the 1971 National Peony Show at Minneapolis, contamination with pollens of other kinds is, highly probable.

	Crosses Using Current Season Pollen	No. of Crosses	Sound Seeds
11.	Tree Peony x '**Laddie**' (triploid?)	1	4
12.	Tree Peony x '**Archangel**' (tetraploid)	1	0
13.	Tree Peony selfed	2	8
14.	Tetraploid Hybrids x Tree Peony	6	0
15.	Lactiflora '**Dawn Pink**'x Tree Peony Hinotsukasa	5	2
16.	Delavayi Lutea x Tree Peony	7	2
17.	Delavayi Lutea x Lutea Hybrids	6	1
18.	Delavayi Lutea x P. lutea (U. of Wash.)	1	2
19.	Delavayi Lutea x P. californica (Santa Barbara, Laning)	6	2
20.	Herbaceous misc. X P. californica	5	0
21.	Tetra Hybrids x Tetra Hybrids	2	8
22.	Triploid Hybrids x Tetra Hybrids	40	8
23.	Tetra Hybrids x Triploid Hybrids	10	8
24.	Triploid Hybrids, x Triploid Hybrids	8	0
25.	Lactiflora x Various Lutea Hybrids	82	73
26.	Lactiflora x Saunders Lobata of Perry F1 (triploid)	45	16
27.	'**Halcyon**' x Bigleaf Quad F2 (tetraploid)	2	1
28	Miscellaneous, no significance	8	0
	COMBINED TOTALS	387	250

As a preface to further comments it is desirable at this point to set forth my methods for controlling pollination. This will give the basis for estimating the reliability that various seeds shown above may be true for the cross.

When pollinating I intend as a matter of principle to use pollen from carefully isolated flowers which have been allowed to open indoors. Occasionally it is desirable to collect anthers from flowers on the plant, in which event I aim to get them before they were accessible to insects. However, as revealed above, when the pollen is interesting enough, I am less particular, but record it.

A second principle which I hold is that the chosen pollen should be coated liberally over the entire stigma before outside or self pollen gets to it, usually before the flowers would have opened naturally. Sometimes I don't get there that quickly, in which case I may still make the cross, but comment accordingly when recording it.

A third procedure followed is stripping of anthers or cutting for the house to control especially unwanted pollen out of the area. There are no other pollen bearing peonies near either my home garden or a planting at our daughter's place, so most of the sources of contamination are under my observation. This procedure is followed fairly rigorously at home but I cannot watch so closely at Sandra's.

A special note on the tree peony crosses: I don't have many of these and will not spoil the flowers until there is a surplus available. As long as this circumstance prevails, I will limit pollinations to those crosses which hopefully will show hybridity in the foliage of resulting seedlings. Meanwhile, I can use a few more tree peony seedlings.

Stored Pollen: Pollinations by Reath Tetraploid Lactiflora are all suspect due to presence of other pollens in the area in those instances where seeds were produced. Only three of the 63 herbaceous crosses gave seeds. We'll have to see the seedlings before making any success claims. '**Mystery**' pollen gave too many seeds for an Ito Cross; I think it must have been a contaminated pollen sample. However, if the contamination was in 1971, this would prove survived viability during storage. Two of the '**High Noon**' seeds are from a Jap lacti, but it only takes two stray lacti pollen grains to make two seeds! I hope to master the storage of pollen, but have no confidence this experience was successful. It has caused me to think upon ways in which I may be inadvertently contaminating pollen, however. For example, when stripping anthers I may be getting pollen on my clothing which is picked up or falls onto my hands later. Even though I may have washed carefully after stripping, there may be many opportunities to carry stray pollen back to the stigmas without realizing it.

For next year, I have considered the possibility that stored pollen may lose viability rapidly after being opened. So, I have one kind stored in three containers, to be opened successively as needed.

Lacti x Tree Peony: These flowers were carefully stripped, but the seeds have germinated rapidly, like so many other '**Dawn Pink**' seedlings from hybrid crosses. However, upon emergence they all look pure lacti. This fall I have removed almost all pollen-bearing lactifloras since my Jap-flowered ones are coming into production.

P. Californica: The veteran botanist, G. L. Stebbins, Jr., has written that P. delavayi is closer to the American peonies than are any other of the Old World kinds. Logically, the cross of these two might have the best chance of working. The seeds will have to grow and so far there is no root action on these, though started late August.

Triploid Hybrids As Seed Parents: Not as good this year, 0.2 seeds per cross compared to 0.5 in 1971. Apparently it makes some difference which varieties are being used. Seeders this time were: '**Cardinal's Robe**' (3), '**Sophie**' (2), and '**Ellen Cowley**' (1) by '**Moonrise**', and, 16209 (2) by Bigleaf Quad F2. The first two also produced seeds last year. Others which had previously seeded did not flower due to dividing and/or late spring freeze. '**Moonrise**' also produced seeds in heads pollinated by '**Cardinal's Robe**' and '**Cytherea**'.
All of the matings with '**Moonrise**' were in the Saunders Lobata of Perry strain, of which it is an F2. I understand that there is no record surviving as to which of the F1 clones produced '**Moonrise**'. However, it is very similar in foliage and flower form to '**Cardinal's Robe**'. Whether or not these have an especially close pedigree relationship, it does appear they are good for at least a few seeds when mated.

'**Halcyon**': This is a supposedly counted diploid and a hybrid. It pleased me this year by producing a seed from pollination by the Bigleaf Quad mentioned above. Surprisingly, the two are physically similar in many respects, the Quad being simply a larger and more sunfast version of '**Halcyon**'. The seed had a cracked skin and was lost to rot, but I will concentrate on this mating for a time. My '**Halcyon**' is from Wild's and may be different from other clones in the trade as this is a strain.

Saunders Quadruple Hybrids: Saunders apparently considered this to be a significant group. They have interested me because of the flared color pattern in some of their flowers and I want to work up some advanced generation seedlings from the F1 generation to see if the flaring can be reproduced. So far, '**Rose Noble**' and 16209 have seeded for me. Miss Saunders has furnished some notes which state that seeds have been collected from '**Sunlight**', '**Sweet May**', '**Winged Victory**', 16234 and other numbered clones. The Bigleaf F2 seems able to fertilize some of these, although it does very poorly on lactiflora and some other kinds. I have also a large-foliaged '**Roselette's Child**' F2 which seems compatible with this group, at least with '**Rose Noble**' and Bigleaf.
Saunders Lobata of Perry Hybrids: This is the herbaceous hybrid group in which I am most interested. They present a large number of garden-worthy F1 generation plants of known pedigree for raw material. There are also some outstanding second generation plants, Moonrise and '**Paula Fay**', for strong pollen. Miss Saunders has furnished the information that seeds have been collected from '**Cardinal's Robe**', '**Claudia**', '**Ellen Cowley**', '**Elizabeth Foster**', '**Grace Root**', '**Great Lady**', '**Paladin**', '**Red Red Rose**', '**Sophie**' and others. Fay and others have reported seeds of '**Bravura**' **and** '**Laura Magnuson**'. I now have a dozen of these and two little Reds.

1972 Ito Crosses: Seventy-five percent of my crosses using current season pollen had home-grown '**Alice Harding**' pollen of plants I have from Ben Gilbertson. In two previous years I got a few seeds from pollinations of these plants, but as yet not a single seedling showing the hybrid foliage of a couple of older plants which I have. However, this is the first season that there has been a fair supply of the pollen. Also, my control against contamination was perhaps a little better at home, though not so good at our daughter's. There are 63 seeds from the '**Alice Harding**' pollinations, hopefully some true. Ten are from pollinations by pollen collected in Alan Harper's garden from open flowers of '**Black Pirate**' and '**Thunderbolt**' and is no doubt mixed with other pollens which may have been left by the bees. How fortunate that the foliage on seedlings of this cross is different from that of straight lacti seedlings,- at least sometimes. I simply cannot continue indefinitely to accommodate doubtful seedlings in my limited space.

Overall: In light of the above, I need to find ways yet to improve my control of contaminating pollen in hybrid crosses. This likely will mean fewer crosses made and fewer pollens used. Until we have explored a lot more possible combinations it will be a distinct disadvantage to reduce the number of pollens tried. However, I now have identified some controllable combinations that will work, and for the time being will concentrate on those. Then, as other plants come into better flower production, perhaps I will understand better how to get the necessary control.

- Don Hollingsworth

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"Give me but ten who are stout-hearted men, and I'll soon give you ten thousand more!". Do you believe it? I do. I have believed it ever since the time when I first became convinced that without a massive, concerted effort by many hybridizers the Peony Society would eventually cease to exist. It's had a close call already. The indomitable, the indispensable, Silvia Saunders suddenly, miraculously, has found no less than 90 actual or potential hybridists. What a family the Saunders, father and daughter!

Is it unrealistic to hope that among these 90 there might be ten "stout-hearted men". Men with the vision and the determination to re-make the peony and eventually bring in those ten thousand society members? Well, five thousand anyway.

Hybridizing peonies requires no special skills whatever. Only some gardening space, some plants, and the resolution to spend a lot of time in the garden at blooming time, even if this should involve taking some vacation at this time.

Probably by now some of you are beginning to tire of my obsession with the "Ito" cross. I promise to taper off on this sometime and get to something else. Right now, though, since I also like to use numbers to emphasize an argument, I'll use it again.

Suppose now that each of us 90 was to pollinate only 100 blooms (3 mature plants) with lutea hybrid pollen next summer. On average, each of us could hope for one live hybrid plant from this miniscule effort. Ninety new "Ito" hybrids in one year; 450 in five; this alone would re-make the catalogs.

That's fine. But now let's suppose that — as ought surely happen — someone should discover what particular pollen in the mixture I used in 1969 gave me a result ten times this good — over 60 hybrids from 582 crosses. The job would then become immensely easier and much effort could be diverted to other promising areas. Other crosses should also be made even now in any event.

The heavy door has been unlatched. Let's push it open together and see what's out there!

- Roy Pehrson

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From "Civilization" by Sir Kenneth Clark (Page 197, talking of the Dutch) —

> "The first tulip had been imported from Turkey in the sixteenth century, but it was a professor of Botany at Leiden, the first Botanical Garden in the north, who discovered its attribute of variation which made it such an exciting gamble. By 1634, the Dutch were so bitten by this new craze, that for a single bulb of a tulip called the Viceroy, one collector exchanged:
>
1000 pounds of cheese	a bed	12 sheep
8 pigs	4 oxen	a suit of clothes

MEMOS FROM ROY PEHRSON —

When speaking with Dave Reath at the Minnesota Landscape Arboretum, I mentioned that I would return briefly to the showroom on my way home. He asked me to pick up his display bloom of Potannini "Tall Yellow" and send the petals to Fred Cooper and request that he analyze the color. He thinks that this plant could be a hybrid with lutea.

I did this. The bloom was so small that I also pulled out the tiny, partly formed petals from a couple of tight buds on this stem.

On reading Mr. Cooper's report I was led to wonder whether the enzymes which control the synthesis of the final chalchone color of the flower may do so in stages which include those other two chalchones he found. Then these intermediates could have been present only in those immature petals.

Here I must disclaim any knowledge in this field. Fred can squelch the idea without any wound to my ego.

- Roy

P.S. There is one surest way of obtaining a hybrid of *P. californicum*. Use the same method as was used in making '**Claire de Lune**' and the "Ito" hybrids. WORK!

Several writers on peony subjects have described a technique whereby it is possible to obtain seeds from varieties which are so completely double that no stamens or carpels are present in the blooms. In this method the emerging stems are cut off at ground level forcing the plant to send up stems from buds which would not otherwise have grown until the following year. These secondary stems may then produce blooms with stamens and carpels which may be used -to produce seeds.

Some of you may be using this method to ensure a greater number of doubles among your seedlings. If so, there is a plant which may interest you.

Several years ago Brand's Peony Farm introduced a large full double red lacti of unusual habit; naming it '**Wilford Johnson**' for an employee. The stems are both short and sturdy and of uniform height. This causes it to present a flat "table top" of solid color. This must surely be the best dwarf or semi dwarf lacti. It would be superb except that the color is not outstanding and because the foliage becomes very shabby much too early.

It may be possible to self pollinate this plant and so produce a strain of dwarf lactifloras of considerable merit. These could then be used in hybridizing experiments too.

- Roy

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SENSE OR NON-SENSE

Yes, Virginia, there is no pastel black peony blossom (and no Santa Claus too yet, not either, also.) - Chris

(See last September's issue of PAEONIA on plastic protection for T.P. seeds.) - Ed.

Dear Chris,

Your article prompts me to tell you about the use of insulating material in road construction. The Dow Chemical Company manufactures foamed polystyrene (Styrofoam) in a grade intended for this use. This is a little more dense than grades commonly used in building construction. It is supplied in "boards" 2 feet wide x 8 feet long and 1", 1½", or 2" thickness.

Without going into details concerning the situations where the use of insulation is indicated, I'll just describe the effect obtained.

At the latitude of Mankato (in Minnesota), frost penetrates a bare roadway to about 5'. If a 2½" layer of this Styrofoam is placed approximately 1' below the finished elevation of the roadway surface, the upward movement of summer's heat is slowed enough so that soil temperature immediately underneath it never falls below 32 degrees. This has been proven through instrumentation (thermocouples). It is probable that this same thickness placed on the soil's surface, as over a seedling bed, would be about equally effective.

Since there is loss of heat around the edges it is necessary to apply the material at least 2 feet beyond the nearest; point requiring protection. If, therefore, someone were to use it over a single garden row, quite a bit would be needed. A seedbed planting could be protected very economically. Any of the types of foamed plastic boards or panels sold in lumber yards should work OK.

What might happen if the soil in a seedbed were kept completely unfrozen? Might it be possible that seedlings would start to emerge much too early and "bump their heads" into the underside of the plastic boards? Would they break? (The seedlings, that is.)

I think nobody knows the soil temperature at which sprouted tree peony seeds are destroyed. Might it be possible, that a thinner layer, which would permit SOME freezing would be better? And how should thickness used be modified for areas where winters are different? Obviously anyone considering the use of insulation should try to evaluate all the variables and make his own best guess as how to proceed.

- Roy

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PLANTS THAT CAME TO MY GARDEN IN 1969
(Chris Laning)

1. Albi-corsica II (albi x p, russoi-variety leiocarpa)
2. '**Moonrise**'
3. '**Moonrise**' F2
4. '**Serenade**'
5. '**May Lilac**' F2
6. mlokosweitschi x macrophylla F2 or F3
7. rnloko x mac #9037 (the best one after '**Nova**' S.S.)
8. **'Nosegay'**
9. Veitchi x mloko F2
10. '**Silver Dawn**' (macro x willmottiae)
11. '**Roselette's Child**'
12. '**Roselette's Child**' F2 (blush)
13. '**Rushlight**' F2
14. 16350 F3 (red)
15. 14400 (albi x mloko x macro)
16. 12128 albi x (macro x officinalis)
17. Quad F2
18. Red in L8 (probably a "Little Red") S.S.
19. '**Garden Peace**'
20. '**Northern Lights**'
21. '**Picotee**'
22. '**Starlight**'
23. '**White Innocence**'
24. '**Prairie Moon**'

Three Herbaceous Species –
1. *P. daurica*
2. *P. lobata*
3. *P. tenuifolia*

Two Lutea Hybrids –
1. '**Age of Gold**'
2. '**Thunderbolt**'

If any of the F2s or F3s is needed, or you could use in your peony hybridizing project, tell me your goal and what you want — next fall I'll divide and send you a piece, without charge.

Plants that in 1970 were added to the peony garden list:

From Miss Silvia Saunders:

1. P. macro — species (small plant)
2. P. mloko
3. P. lobata
4. '**Claire de Lune**'
5. '**Silvia Saunders**'
6. albi x corsica II
7. albi x corsica I
8. '**Archangel**'
9. Quad F2
10. '**Audrey**'
11. russi major
12. Little Red (unnamed)
13. Veitchi x mloko

From Gratwick:

1. Tria tree peony (lutea hybrid)
2. Saunders F2A (lutea hybrid)

From Smirnow:

1. Yaso No Mine — T.P.
2. Gessekae — T.P.
3. '**Alice Harding**'

More from Miss Silvia Saunders:

1. '**Angelica**' (sibling of '**Silver Dawn**')
2. Albi x lobata F£
3. Albi x lobata Fp (deceased)
4. '**Daystar**'
5. P. obovata alba
6. P. lobata
7. P. lobata
8. '**Picotee**' F2
9. '**Picotee**' F2
10. P. tennui (single)
11. P. tennui. plena (double)

The 1970 plants are not ready for dividing.

ROY SAYS:

Silvia Saunders has previously explained that when a plant from the Saunders garden is described as an F2 it does not mean that it has resulted from the deliberate controlled, hand pollination of the parent F1 hybrid. Instead, such plants have been grown from those chance-set seeds sometimes found on the often quite sterile F1 hybrids.

It is reasonably certain that in all cases the F2 designation is correct, but the possibility that an outside contaminating pollen grain was responsible cannot be completely ignored. This possibility, small though it may be, becomes multiplied as succeeding generations (F3, F4, F5, etc.) are produced. It's probable that very few peony hybridizers make more than a very few controlled self pollinations. This is true in my own case. I do save and plant many chance-set seeds which seem "just too interesting to throw away."

If some of you should deplore such careless "mongrelization" of the peony, I can justify it only by believing that as time goes on you will do the same.

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WISHING YOU ALL A HAPPY AND BLESSED CHRISTMAS SEASON!
- Lois and Chris