

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 –

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The PAEONIA is authorized by Miss Silvia Saunders.

Our leader and teacher in hybridizing is Roy Pehrson.

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Suggested yearly contribution to cover
expenses of printing and mailing is \$2.00.

PLANNING PEONY CROSSES TO MAKE IN 1977

Don Hollingsworth

Sometimes the most difficult aspect of amateur plant breeding, as I experience it, is to follow through on the work plans that have been made. It is not difficult to envision a program of matings, for example, while things are quiet, but when flowers are bursting out all around one, getting the visions converted into reality is sometimes an entirely different matter. For one thing, I find that it is not always possible to take off from my job at the times most convenient to the purposes of the peony breeding project.

In the second place, being located on the early season side of the peony growing "belt" means that I have only a limited opportunity to acquire pollen from other growers for use during the current season. Thus, I must pretty much make do with pollen sources that are available locally. If the desired pollen is not on hand when it is time to make the planned crosses, they don't get made. In the absence of advance preparation and when a sudden warming trend brings out a lot of flowers in a short period, good intentions can pretty easily get reduced to a shambles.

One thing which will reduce the chances of bumbling through a flowering season with nothing purposeful to show for it, is to have several different lines of breeding going. Just what these might be for a particular person depends on what kinds of flowering aged peonies are on-hand and what interests or objectives the person holds. Perhaps the most important objectives which contribute to the eventual production of unique new peonies are the intermediate ones. These are the learning objectives. For example, one might produce some seeds just to have them for germination studies or make certain crosses just to get a better look at what the parent plants may have to offer in a breeding program. Will they produce seeds, easily or with difficulty? Do the seeds germinate reasonably well? Are at least some of the seedlings vigorous? This type of effort leads to the sorts of knowledge that make achievable the future control of desired outcomes.

There are some general principles which guide my breeding decisions that are no doubt, close to the principles followed by other persons who have similar interests.

1. Aim to produce or acquire at least some seeds every season, whether or not specific progress is made on the chosen priority lines of breeding. Use them for testing ideas and techniques, for comparing with seedling of the controlled crosses as a basis of estimating whether the latter are genuinely of the desired cross, or simply for trading stock.

Continued page 9

LETTER FROM: Keith Goldsmith, Goldsmith Nursery
9108 Olympic View Drive, Edmonds, Washington 98020

Dear Paeonians,

December 15, 1976

The day's mail brought us the December issue of "Paeonia" and a letter from Don Hollingsworth concerning *P. brownii* and *californica*. The day brought me a touch of something that kept me inside all day, so, instead of planting peonies, here are some musings:

Planting peonies in December? The Puget Sound climate (incidentally, got the National Geographic today, too, which see) usually allows planting right up to growing time (late February). In fact, while I was still teaching, we often got our planting done during Easter holiday. Mid-October is ideal here, and we have customers' orders all out by then, if possible. We run a general nursery and landscaping business, too, so we usually are swamped at the ideal planting time. That same climate stretches out our blooming season from '**Daystar**' about April 15 to '**Charm**', '**Elsa Sass**' and such, about July 1st. Now for the disadvantages — chickweed, quack grass and company grow all winter long, so one has to weed all year, too.

One likes to think he's doing something really important, whatever he's doing. We have thought it important to keep all those lovely hybrid varieties available. We're pretty sure that it would be better business to grow more of each of a few varieties on our limited space, but we couldn't bring ourselves to cull any of them. (There are some that have a terribly exasperating habit of root growth, and I curse them as enthusiastically when I try to find a decent division in the fall as I praise their exquisite flowers at blooming time. I just planted a whole bunch of '**Rose Diamond**', '**Ludovica**' and '**Laura Magnuson**' thinking how nice it would be if they grow nice roots like '**Mercy**' or '**Picotee**' or '**Early Windflower**'. Is it our growing conditions that cause the crowns of the first three mentioned to sort of dry-rot away leaving all these healthy pieces to sprout up masquerading as a fine clump? Only occasionally do we get a really good "normal" root on any of those three.

To get back to my point. We got the idea from reading other growers' lists, that perhaps we have the only available stock on many varieties. If that is true, it worries me, because we won't be here forever. I wonder if it would be a proper function for the Society to take a census to see who is growing what and perhaps undertake some scheme for encouraging and ensuring stewardship? See David Reath's remarks in Paeonia. Those remarks had their emphasis on preserving varieties useful in hybridizing -- I would go further, having mourned the loss of a good many excellent lactiflora varieties from the market over the past 25 years.

In general our local customers are of two types — former Midwesterners who buy peonies more from nostalgia than from any keen interest in the species' intrinsic qualities, and younger people who more or less stumble onto us and are victims of love at first sight. Very few Pacific Northwest gardens have much suitable space for peonies since the emphasis is more on rhododendrons, azaleas, camellias, heathers, fuchsias, begonias than on snowball, lilac, peonies, lilies, iris, delphinium, etc. We do have a strong interest in the area in flower arranging, however, and flower arrangers with oriental influence find the single hybrids ideal for their purposes, which leads, me to the other really important thing that we are doing with the peonies.

I should say, Peggy is doing. Most of our selling is done during her marathon display of peony arrangements in our (what we still call "the shed") showroom. She is masterful in displaying hybrid peonies! Her use of other materials about the place to draw attention to the subtle shadings of petals, the filament color, details of stigma, carpel and necklace, form and so on seems inspired. I'm sure that no one can walk by any peony in any set of circumstances without taking another look, but it's very

difficult to avoid studying the details of the arrangement and of the flowers in Peggy's peony arrangements, and remembering them with pleasure. She is providing our visitors an aesthetic experience and inspiration that is highly valued. Our "farm" is a mile away from our place of doing business and we do take people down to see the plants if plant form is important to them in making selections.

In this connection let an outsider to hybridizing circles make some comments . **'Red Charm'** has to be one of the finest red flowers of any kind ever seen, but I wouldn't want to see a search for such perfection in doubling, fastness of color and precise form, not to mention foliage, stem stiffness and rigor of plant, make us undervalue the less "perfect" but more detailed and subtle varieties. The crooked stem of an unstaked **'Red Red Rose'** gives it a use as a cut flower, for instance, that **'Red Charm'** with its stiff stems can't fill; the fading quality of **'Rosy Wreath'**(what a pink) or **'Cecelia'** or **'Rose Diamond'** gives a quality of the way things are in life. That red stigma on **'Horizon'** is worth a thousand red stigmas on a double.

Well, the flu must be really getting to me. I like them all and if someone will come up with a semi-double of say **'Daystar'** color and foliage and plant form and time of bloom that will hold for a good two weeks and set such beautiful seed pods and whose foliage will turn even more spectacular in the fall, I'll add it to my collection — if I can afford it — but I'll keep **'Daystar'** too.

I'll have to slip this into the mailbox before Peggy gets a chance to read it -- she'd be embarrassed.

Best wishes,
Keith Goldsmith

p.s. Incidentally, I don't care for the hybrid petal sheen on lactifloras — or is it that I don't care for it at that time of year?

SAVE THE CLONES!

All Saunders hybrids should, along with others, — "Keep all these lovely hybrid varieties available", (say the Goldsmiths).

For many years people have been talking and writing about the high priority that should be placed on the preserving of species, cultivars, hybrids, etc. in the peony line. What is envisioned is something on the order of a grand test garden, one that preserves all our valuable peony material. And here we have it again — but this time by two people that have a nursery to back up their logic and materials that could start off just such a project. I know, and you all do too, that there is small likelihood that man-power and money-power are available. So, let's do nothing about the project — or could we think in a little different line (take a different tack) and have end results which could be entirely satisfactory? Let me explain:

To begin with —

2. Each Paeonian (for this article a Paeonian is anyone who reads Paeonia Newsletter) should buy one scarce Saunders hybrid for this project.
3. Propagate by dividing it so as to build a small stock and then make it available to other's (for a price, if so desired).
3. A running inventory of who has what and also its availability (how many you can sell or share with others).
4. Clone swapping (of precious Saunders hybrids if selling and buying seem mercenary or out of order).

5. Failures should be reported to Paeonia immediately upon noting lack of success with the clone so that others may take up the challenge.
6. Notify Paeonia what hybrids you already have, the quantity (number of plants of each of your reported clones), and ease of cultivation and ease of increasing in numbers.
7. We may also need a list of other than Saunders hybrids which are difficult to obtain, and incorporate them into our project.
8. Try to interest the American Peony Society in setting up a similar program for the lactifloras.
9. Mr. Goldsmith, will you give us a list of Saunders hybrids that you think are in the greatest danger of being lost? We should start on these clones first.
10. In the event that the American Peony Society would follow the Goldsmith suggestion and "take a census to see who is growing what and perhaps undertake some scheme for encouraging and ensuring stewardship", we could limit our project to just Saunders hybrids — and Glasscock's — or join the Peony Society in its over-all effort.

Don't bemoan lack of cooperation —do something about it.

Limited input results in limited output. If you have no new ideas, state your thoughts of material presented in Paeonia. Constructive criticism is good!

The following is a complete listing of hybrid herbaceous peony stock, available from
Goldsmith Nursery, 9108 Olympic View Drive, Edmonds, Washington, 98020

Alexander Woolcott	Claudia	Fortune
Amity	Constance Spry	Frances
Angelo Cobb Freeborn	Coralie	Garden Peace
Anniversary	Crusader	Gay Cavalier
Archangel	Cytherea	Good Cheer
Artemis	Dakota	Good News
Athena	Daystar	Good Will
Audrey	Defender	Grace Root
Ballerina	Diantha	Great Lady
Birthday	Diana Parks	Green Ivory
Bordeaux	Early Daybreak	Gillian
Bravura	Early Windflower	Halcyon
Bright Diadem	Echo	Heritage
Buccaneer	Edward Steichen	Honor
Camellia	Elizabeth Cahn	Hope
Campagna	Elizabeth Foster	Horizon
Carina	Ellen Cowley	Edward Watkins
Cavatina	Emblem	Illini Belle
Cecelia	Erebus	Janice
Chalice	Early Red	Jean Cowley
Challenger	Fantasia	Julia Grant
Chocolate Soldier	Fidelity	Laura Magnuson
Claire de Lune	Firelight	Legionnaire

Legion of Honor
 Liberator
 Lotus Bloom
 Lovely Rose
 Ludovica
 Lavender
 Little Dorritt
 Lady Gay
 Laddie
 Madrigal
 Magnolia Flower
 May Lilac
 May Morning
 Maytime
 Mercy
 Mid May
 Montezuma
 Moonrise
 Mlokosewitschii
 Nadia
 Nosegay
 Nova
 Officinalis Rubra
 Officinalis Ophia
 Pageant
 Paladin
 Patriot

Picotee
 Postillion
 Papilio
 Queen Rose
 Red Charm
 Red Glory
 Red Lacquer
 Red Red Rose
 Requiem
 Rose Crystal
 Rose Diamond
 Rose Garland
 Roselette
 Rose Marie
 Rose Noble
 Rosy Cheek
 Rosy Wreath
 Rushlight
 Rose Tulip
 Salmon Glow
 Sanctus
 Scarlet Tanager
 Seraphim
 Serenade
 Shell Pink
 Silver Swan
 Skylark

Sophie
 Sprite
 Starlight
 Sweet May
 Smouthi
 Sunlight
 Tenuifolia Rubra
 Tenuifolia Rubra Plena
 Victoria Lincoln
 White Innocence
 Winged Victory
 Zulu Warrior
 Your Majesty
 4992
 8277
 Winterthur
 Foundling
 Frosted Rose
 John Harvard
 Late Windflower
 Little Cream Starlet
 179
 Early White
 Love Birds
 Center Point
 Goldsmith Seedling

SEPTEMBER 30 OF LAST YEAR

Miss Silvia Saunders has been "emptying out my garden as well as I can," resulting in giving me ten of her last (and probably her best) peonies. The list of plants reads like this:

- | | |
|----------------------------------|---------------------------------|
| 1. Sunlight (dwarf Quad, hybrid) | 6. Moonrise |
| 2. Gwenda | 7. #16209 (now named May Music) |
| 3. Two little reds (different) | 8. Good Cheer |
| 4. Camellia | 9. Lutea hybrid. |
| 5. Garden Peace | |

Some of these plants are available from catalogs -- But some definitely fall into the class of collector items so consider them to be included in the "Save the Clones" group.

Also, Roy Pehrson has given me a piece of his plant, '**Eclipse**'. This plant is so scarce as to be unobtainable. If it can be propagated each of you hybridizers should have a piece of it. '**Roy Pehrson's Best Yellow**' is doing very well in my garden but is a "guest plant" so shouldn't be shared with others without his consent. I could give you some of its pollen, though.

- Chris

OBSERVATIONS THAT SEEM TO RUN COUNTER TO GENERAL ASSUMPTIONS

ASSUMPTION # I

Peony seeds in dormant state have seed coats that are almost impervious to water:

All tests that I have been able to devise show that the hard dry seed coat is no barrier to moisture. Try one test: Place dormant seeds in slightly moist vermiculite and see for yourself that the wrinkled dried-out seeds have become round and filled out¹ in five days, or less

ASSUMPTION # II

If peony seeds are permitted to dry out in the fall, they become dormant and will not germinate until the following year.

Actually, seeds will start germinating regardless of the time of year if given proper treatment. No! I don't mean anything special! Just place them in damp vermiculite and hold them at room temperature, 70 to 80°F daytime, and 60 to 70 at night. Roots appear within 5 to 10 weeks time. After rooting they will need about three months of refrigeration at 35 to 40°F and then be planted in the garden. YOU DON'T HAVE TO LOSE ONE YEAR IN THIS GERMINATION PROCESS.

TEST: Of all the seeds that I received from other hybridizers, and seeds of my own (which were to have been distributed to those who requested seeds), a few of each kind were kept and checked for germination. From August 15 until December 20, batches of seeds were placed into damp vermiculite at various times. The early batches — germinating before December 1, were planted in the garden. The rest of them will be held in the refrigerator until spring. The final test batch was placed in vermiculite on Dec. 20, 1976, and now on February 6, 1977, are sending out roots. These seeds had been left in the garage — most of them still in their seed pods until the test germination was started on Dec. 20. So, I can't see that the argument of dormancy is valid. These tests were made with many kinds of seed: lactiflora, hybrids, species, tree peony, suffruticosa, lutea hybrid, delavayi hybrids, etc.

There is one great exception: Lobata, or rather officinalis with all its variations, have for the most part remained dormant. Cold and warm treatment seem to do nothing for them. In past years seeds of this type have lain dormant for two years or more in the seed bed.

Please tell me if your experiences tend to corroborate these findings. Also, see June, 1972, issue of PAEONIA, page 13, question by Chris and answer by Roy Pehrson. Maybe you don't have this issue available, so let me write it down right here.

QUESTION: In step #2 you say "bagged up between Sept. 25 and Oct. 15" But don't the seeds become dormant in the time between — say August 20 to September 25 through October 15?

ANSWER: Yes, seeds do go dormant, that is why it takes 3 months to root them. If put in moist medium as soon as barely ripe it may take 5 weeks or less. Then they'd have to be planted out the same fall for they couldn't possibly be held over winter.

- Chris

HYBRIDIZING OF LUTEA HYBRIDS

David Reath

Paeonia lobata (called *P. peregrina*, by Stern) is one of the most important herbaceous peony species that we have. It is a tetraploid species which contains genes for true red as well as a set of genes for cream yellow. Some of the many varieties of this species contain four doses of red as well as four doses of genes for cream color. The plant that I have of '**Otto Froebel**' (obtained from Mr. Fay many years ago), is just such a plant.

Also this species is unique in that it contains an inhibitor gene for the anthocyanin colors of the lactiflora species. Therefore, in crosses of Lactiflora x Lobata, the only anthocyanin (red) colors to show are those from the lobata parent. The colors are extremely clean and lack the blue tints of lactiflora reds.

There can be a single dose for red with the result that the seedling is pink in color. Two doses give the reds. The pink and red colors can be modified by the presence of the cream gene. In cases where there are two, three, or four doses of cream as well as two, three or four doses of red genes, the colors are deep salmon or orange reds. It is these colors that I'm most fond of and have selected in my seedlings.

In '**Moonrise**' we have one or two doses of genes for cream color with no doses of genes for reds. Therefore the cream color is able to show. Most of our good lobata reds also have one or more doses of cream genes which do show by imparting a salmon or orange tone to the red coloring. It is this effect of the cream genes that makes the lobatas so novel from reds of other breeding.

All the varieties of lobata that I raise have wonderful plant habit in that they stand quite erect and never sprawl over the ground. This is in direct contrast to the plant habits of the many forms of *P. officinalis* that I have, including several singles from Stern.

The lobatas require some winter protection in very cold areas such as here, and in those areas that are very cold with little snow. It is for that reason that I haven't offered the vast number of lobata and officinalis varieties that I grow, in my catalog. This past fall I gathered most of the varieties I raise and placed them in a bed where they have been mulched, with straw and evergreen boughs.

All varieties of lobata form adventitious buds on root pieces. This is a tremendous advantage in propagation.

All varieties of pure lobata that I have are singles. We do have doubles and Japs in pure officinalis. In combining; Double officinalis x single Lobata, I was able to select three outstanding double orange-red seedlings. They, of course, are very fertile but unfortunately exhibit some of the sprawling habit of officinalis, though to a lesser extent than pure officinalis.

This past summer we were able to test several of the F1 Lutea Hybrid Tree peonies for fertility. There are now several advanced generation lutea hybrids that are quite fertile as pollen as well as seed parents. By using pollen from these fertile seedlings on the F1 we were able to set a considerable number of seeds.

We have planted seeds from the following lutea hybrids:

' Age of Gold ' (this has been the most highly fertile of the F1's.)	' Chinese Dragon '
' Amber Moon '	' Corsair '
' Black Panther '	' Golden Isles '
' Black Pirate '	' Gold Sovereign '
	' Harvest '

'High Noon'
'Marchioness' (similar to Age of Gold in fertility)
'Mystery'
'Princess'
'Renown'
'Roman Gold'

'Thunderbolt'
'Vesuvian'
'Wings of the Morning' (this variety appears to be an advanced generation seedling; I must check with Silvia on this.)

Our method of pollinating these is simply to apply the pollen to the stigmas just as the bloom is starting to open. We do not bag the flowers but do apply a generous amount of pollen to the stigmas.

We average about one seed per ten flowers pollinated. This seed production is achieved in crosses of F1 x fertile pollens from F2 or more advanced generation seedlings.

In crosses involving Fertile Advanced generation seedlings x Advanced generation seedlings, the number of seeds per cross is much higher. Also it is necessary to emasculate the flowers before they open, pollinate and then bag the flower to prevent contamination.

David Reath (1/1/77)
Vulcan, Michigan 49892

REPORT FROM NORTH DAKOTA

The weather pattern of 1975 and 1976 combined was surely bad enough to destroy any but the most hardy of plants in our area. The last few days of June and the first few days of July '75 brought us some 20 inches of rain which left our peonies standing in water for days at a time but we did not lose a plant. Then spring of '76 came on with an oversupply of subsoil moisture — and no rain from April 10 up until now, December 1st, when we have just enough snow to make the ground white and that's all. We had several showers of 0.10 to 0.2 inches, but nothing heavier. So far as I can see, all plants are A.O.K. I don't know what to expect next spring. The peony plant has again proved itself very durable.

The U.S.S.R. imports should all have flowered in '75. Only *anomala* gave me one small single nodding bloom of a purple-red color. It self-pollinated and I got a number of seeds from it. This year it had gone back to only the stems and no bloom. "Poceda" did have four very full and heavy medium pink flowers which the stems could not hold up. It had no pollen nor carpels, "Novostj Altao" is a vigorous grower, had 21 stems with one small bud on each in very early May when we had two mornings in a row with 21 degree temperature and the buds all blasted. The fourth plant listed as "Hybrida Pall" a *Tenuifolia* type, still has not bloomed.

As for new seedlings in '75 I saved only two plants, one a large light pink bomb double and the other a semi-double red of a very fine color. This year I had four that I felt were good enough to keep, one was an extra fine looking bomb type double white which my records show as from **'Plainsman'** seed parent and **'Archangel'** pollen parent. There were two identical blooms on stems that came out of the ground a bare half inch apart and when I dug them I found the two stems were on separate roots, side by side, and "even the roots looked alike, Evidently they were twins — two plants from one seed. The other plant was also pure white, ball shaped, that never completely unfolded, perhaps because by that time it was getting dry. It has the same parentage as the twins. The other two were full double rose type medium pink, quite similar and of **'Hedgemaster'**-open parentage.

I also received six peony roots from my contact in Lithuania, U.S.S.R. and I sent her some of my best varieties which she says she never did receive. I will send her another lot of the same varieties next fall via registered Airmail and see how far they get and where they end up.

Next season I'll have a good supply of '**Goldilocks**', and since I have no prospect of viable pollen carrying yellow genes, I called on some of our hybridizing friends for any help I could find to solve this problem. The response was much above expectations as Roy Pehrson sent me a plant of his best yellow and also the one next to it which appears to be a sibling as the roots are very similar. When I made marker stakes of creosoted wood and Aluminum plate, I gave them the titles -Roy's Best Yellow and Next To It,

Don Hollingsworth came through with 8 divisions of possible yellow gene stock including one Ito type. All were planted, well watered down and mulched to prevent repeated freezing and thawing this winter. I expect them all to come on fine next spring. The Ito type from Don has a woody stem and buds above ground. I found that I also have one seedling which is of this type about three years old. I used Single Tenuifolia pollen on Hakuo Jishi tree peony and got about a dozen seeds which were planted in the fall of '72. Four plants came up and still survive. Three are typical tree peonies in every way and have a woody stem about five inches tall, the other one came up exactly like the rest but is still very small. It had two small tree peony leaves this past summer, then died down to the ground after the first hard freeze. I dug them all and transplanted them. The three are pure Tree Peonies but the little one had a herbaceous top and has a nice underground bud ready for next spring. Does it qualify as an Ito? It is the reverse cross from the Ito family. All plants came out of the ground with a nice clump of dirt on their roots so I did not like to disturb it to see what the root looked like. This year I disposed of all standard variety peonies except a few of '**Red Charm**', '**Prairie Moon**' and '**Claire de Lune**', plus some of my own originations which are being increased and, of course, my breeding stock.

My new knee functions very well and I am having my other knee done this month.

- Ben Gilbertson, Kindred, North Dakota 58051

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PLANNING PEONY CROSSES TO MAKE IN 1977, *continued from Page 1*

2. Among chosen priorities, have at least one line that is easily produced, such as Tree Peony x Tree Peony, Lacti x Lacti, Advanced Generation Hybrids, or Lacti x Little Reds, Hybrids and Lobata. Add to this one or more of the known promising lines of effort that are more difficult, where progress is likely to be slower. The latter has greater potential to yield results, but the former is more certainly rewarding, at least in the near term.
3. Then, aim to keep trying new experimental approaches. On the one hand, test new techniques in effort to make the difficult lines easier. On the other try new crosses; attempt to open new lines.

Some crosses that I'll be trying to make in 1977 will perhaps illustrate what I've tried to say above.

Lacti. Cultivars x '**Good Cheer**'.

One of the Little Reds hybrids (Saunders, P. officinalis cvs x Lobata of Perry) that has been demonstrated to be one of the most promising pollinators, yet the potential of '**Good Cheer**' is almost entirely undeveloped. We should, I believe, raise several thousand seedlings of it from the finest Lacti garden and show table cultivars. The pollen takes easily on Lacti so that it is entirely suitable to use on those rare, small carpels found in the more double flower forms. '**Good Cheer**' has

demonstrated its ability to give forms, at least as well, if not more so, than any lobata or officinalis type previously used. Add to this that it has the unique vermilion pigmentation that is associated with the Saunders Lobata of Perry Hybrids. If one is unable to get '**Good Cheer**', then one of the other Little Reds is certainly worth using, at least enough to produce a test lot of seedlings.

Pollen collection on '**Good Cheer**' can be a risk. Once the flowers show color, they will pop open very fast on a warming day. I like to leave the flowers on the plant, so I bag them to keep insects from spoiling my plans.

The Itoh Cross, Lacti x Lutea Hybrids

Some have become discouraged because of no results from their early efforts with the Itoh cross. It has been baffling to me also. However, I am now confident that it can be mastered if one will be meticulous at every step. Collect as much, pollen as possible; check each sample under a microscope for plump grains and test it on sugared agar culture if you have the means. (The test procedure was published in PAEONIA about two years ago.) Use the best looking pollens, make many crosses and protect them strictly. This means pollinate only buds that have been precluded from contact by undesired pollen, either self pollen, or any from outside sources. If you can't be present as the Lacti buds are barely opening, bag any buds which you desire to pollinate later. If the Lacti cultivar has its own pollen, emasculate the bud. (strip away its petals and anthers) a day or so ahead and protect the stigma's from insects by bagging. Otherwise, forgo using it. I now believe that only a few grains of contaminating pollen on the anthers will make the flower useless for the Itoh Cross.

Another source of disappointment in the Itoh cross is that some of the seeds do not germinate. This is no doubt partly due to "missing" genetic material and is quite common when working with any hybrid pollens. It is much more prevalent and a more obvious factor when some of the advanced generation of early hybrids, such as 'Archangel' are used on Lacti. In the Itoh Cross, it is less obvious as most of the harvested seeds appear sound. Then, when those which germinate prove entirely Lacti, one naturally presumes the ungerminated seeds were also Lacti. This may or may not be true. It appears that some Lacti cvs are more compatible genetically with Lutea Hybrid pollens. Try an assortment of Lacti pod parents with each different Lutea Hybrid when possible., In my own work, '**Gertrude Allen**' and '**Miss America**' appear to have been quite superior to other Lacti in producing Itoh Hybrids. "Carr East #2" runs a good third, while '**Shaylor's Sunburst**' and '**Alice Roberts**' have been successful. (When using '**Miss America**' or other Lacti flowers which have distorted carpels, look them over carefully and break off the stigmas of the bad ones, so that valuable pollen is not wasted.

Garden Hybrid x Garden Hybrid

This is called the Landscape Gardener's Cross because it does not mess up the flower. For this I use together only the plants in a given hybrid group, such as the SLP (Saunders Lobata of Perry) Hybrids or the Quads. One may use the Lutea Hybrids successfully also. In the SLP, I prefer to use the F1 cvs as pollinators because the flower colors and doubling are better than in the F2 cvs of this group which I have access to. '**Cytherea**' and '**Red Red Rose**' pollens are giving as good results as '**Moonrise**' on the F1 cvs of the SIP Hybrids. I get a few seeds every year, and they geminate rather well. Their vigor is more variable, but some are strong and that's good enough to justify the effort. Eventually, of course, the effort will have to be evaluated by the ornamental performance of these new F2 seedlings.

(This article to be continued in the next issue of PAEONIA.)