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Editor and Publisher:

Donald R. Smith
46 Exeter Street
W. Newton, MA 02465

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A PRELIMINARY REPORT ON ORANGE TREE PEONIES

By Bernard Chow

Three blooming seasons have passed since the first orange bloom appeared in my garden in 1996. At this time, I have about ten plants giving blooms of different orange shades at some stage of blooming. I would like to compare the results of my preliminary observations on orange peonies with the opinions that have appeared in recent issues of *PAEONIA*.

I have not grown *Tessera* myself. However, the description of its behavior by Harold Entsminger (Vol. 28, No. 3, p.2) sounds quite familiar to me. "Tessera blooms well here, and reliable year to year. Its color is elusive, varying greatly from year to year." After three years of observations, my preliminary results can be summarized as follows. Orange color varies year after year and from stem to stem for the same plant, from plant to plant of the same pedigree, from bud to bud of the same stem and from day to day of the same bloom. Harold Entsminger believes that the color variations exhibited by Tessera are due to soil and weather conditions, (e. g., hot or cold, etc.). However, all my orange peonies share the same soil and weather conditions. My hypothesis is that while the water-insoluble pigments (carotenoids) stay stable, the water-soluble red pigments (anthocyanidins) tend to be more recessive when the plant is immature, when the stem is young, when the bud is secondary or when the bloom has been exposed to sunlight for some time. The recessive tendencies of the red pigments make the flowers appear more yellow rather than orange in color.

The pedigree of my first orange peony, I13, (first bloom 1996), is Seidl's #16 x Golden Era. When Bill Seidl saw a photo of this flower, he predicted that seeds from #16 x Brassy Lady would have a better chance for orange color (Vol. 28, No. 2, p. 3-4). Three plants, (I30, I31, & I32), of this pedigree bloomed for the first time one year later (1997). None of them showed better orange than my first plant, I13. However, in the next blooming season (1998), all three

showed their superiority in orange compared with the first orange peony. Therefore, Seidl's prediction was eventually proved accurate. Among the three plants of the same pedigree, the strongest growing plant, I32, shows the strongest red shade and the weakest growing plant, I31, shows the weakest red shade. Blooms from a younger stem of the same plant are more yellowish than those from the main stem. Where there are secondary blooms, they are always more yellowish than the main blooms. Generally, orange blooms get comparatively more yellowish in appearance at later stages of blooming. I believe all of these preliminary observations support my hypothesis stated above.

Since advanced generation hybrids are very rich (diverse) in genetic material, it is quite common for these plants to contain genetic material for both yellow and red flower pigments. As a result, after three blooming seasons, more than ten percent of my advanced generation hybrid peonies show various degrees of orange shading at some stage of blooming. My preliminary observations strongly support the conclusions given by Bill Seidl and Don Smith (Vol. 28, No. 3, p.6). "Our best chances for orange lie in working with the advanced generation lutea hybrids, where some success in this direction has already been achieved and where fertility is not a major barrier." As stated earlier, I already have about ten advanced generation hybrid tree peonies with blooms of various shades of orange. This season I made many crossings among them and I am now anxiously awaiting the offspring and hoping for improved results in the years ahead.

Editorial Comments on the above article by Bernard Chow:

Along with the above article, Mr. Chow also sent about a dozen photographs of his orange hybrid tree peonies including all of the varieties specifically referred to in the above article. In one instance, the same variety (I32) was photographed in two different seasons to show the flower color variation exhibited from year to year. It is quite amazing how much variation there is in some of these flowers from one season to the next. One of the flowers was photographed with someone holding an orange next to it. This is a simple but clever idea, that makes it much easier to judge the true color of the flower (and all the others as well, since it is stated that the same film and processing was used in each case). Although none of these flowers are as orange as the real orange, a few are really quite good. I tried to rank these flowers according to how orange they appeared to me. The best of these varieties are listed in Table 1 in order of decreasing orange color. Table 1 also gives the parentage of each variety.

Table 1. The parentage of recent "orange" tree peony hybrids.

Garden Name	Seedling No.	Seed parent	x	Pollen parent
Loyola	I-32	Seidl Seedling (SH-16)	x	Brassy Lady
Kansas	I-51	Unknown	x	Mixed
Iowa	I-30	Seidl Seedling (SH-16)	x	Brassy Lady
Mascot	I-13	Seidl Seedling (SH-16)	x	Golden Era
Kenka	I-31	Seidl Seedling (SH-16)	x	Brassy Lady

Seidl seedling (SH-16) = (A-198 x Chinese Dragon) is described as flesh colored blended rose
Brassy Lady = Golden Era x (Golden Era x Chinese Dragon)

FLARES, PICOTEES AND OTHER FLOWER COLOR EFFECTS IN HERBACEOUS PEONIES

By Harold Entsminger

Flared and picoteed effects in herbaceous peonies can be quite stunning! They present an interesting and phenotypically genetic diversity over self-colored flowers. One would think that these dense areas of pigmentation in flower petals, such as flares of pink, red and purple, and picotee or darker edged petals, would be dominate traits in flowering plants. The same might be expected to be true for freckle effects such as those found in the petals of *The Fawn*. However, these spots, flares, freckles and edgings sometimes show up in crosses between two self-colored species. For instance, in one of my controlled crosses using potted plants kept indoors of P. mlokosewitschi x P. wittmanniana, I received a wonderful little plant. It has light pink petals with deep pink flares and a deep pink picoteed edge. Another one has a little red dot at the base of each petal. All other siblings are yellow-self.

To me, this suggests that milky or spread color factors may mask certain species color patterns. In the tree peony group for example, crosses such as Potanini Trolloides, a clear self yellow, x *Gessekai*, a self white, can produce a peony with a remarkable flare.

I am involved in a hybridizing project which hopefully will produce more variety in my peonies through the process of crossing various herbaceous peonies that have flares (i.e., *Sunlight, Firelight, May Music, Magnolia Flower, Nancy, Rose Noble* and *Athena*). My goal is to get greater variety in flower color effects.

COMMENTS ON THE EFFECTS OF SOIL ON FLOWER COLOR EXPRESSION IN PEONIES

by Harold Entsminger

After moving my peonies to a different location, I noted that changes had occurred in the flower color of several varieties. For example, *May Music* which normally is flared was flareless. *Athena* was almost pure white and *Tessera*, which is normally a copper color, was yellow. As a result, I had my soil analyzed. One element which showed up in high concentration was Lithium. Lithium is known to decrease pigmentation density in humans, especially eye iris melanin densities. This makes me wonder if there is a similar effect on plant pigmentation. To study this further, I have planted *May Music* and *Athena* in pots filled with commercial potting soil with no Lithium content. I will watch these carefully over the next few years to see if any changes in flower color occur.

Over the years, I have read a number of statements in the pages of American Peony Society Bulletins saying things like "I want to buy the light form of *Leda*" or "Visitors from the midwest were surprised to see P. ----- blooming with such a beautiful light color." Weather and soil conditions are known to effect flower color changes in peonies. Could Lithium be a factor? And will it keep our pretty flowers from biting the neighborhood animals that stray into our gardens? Keep hybridizing for those beautiful orange peonies.

Editorial Comments on the previous article:

Although, I do agree with the basic premise put forward by Harold Entsminger in the previous article, he may have chosen a poor example to demonstrate his point concerning the effects of soil type and conditions on peony flower color expression. As it turns out, there may indeed be two distinct (color) forms of the lutea hybrid *Leda* (i.e., a lighter and a darker form).

When I visited the gardens of Bill Seidl many years ago, I photographed a flower of the Daphnis hybrid *Leda* (D-308). I remember commenting at the time that this flower was much more double than the flowers on my plant of *Leda* or pictures that I have seen of *Leda* (e.g. Klehm's 98 catalog, page 23 or Allan Roger's book Peonies, plate 70). Shortly after that, I remember reading somewhere that there were two different forms of *Leda*, but I can't remember where. I had not given this subject any further thought until just recently.

Then, this past spring I had the pleasure of meeting Nassos Daphnis and Lee Gratwick along with Walter Good at Linwood Gardens in Pavillion N. Y. During a discussion with Daphnis concerning *Leda* (which is one of my favorite shrub peonies), I mentioned that there seemed to be two different forms of Leda in distribution. Daphnis replied that he felt sure that the more double form of "*Leda*" was not *Leda* at all, but a "sister" plant from the same cross called *Zeus* (D-309). *Zeus* is described as being "like *Leda*", but with semi-double to double flowers. I suspect that one of these plants has flowers that are also somewhat lighter than the other. I believe that Bill Seidl has *Zeus* and not *Leda*. My plant of *Leda* came from Reath. I do not know the origin of Bill's plant. To my knowledge, *Zeus* has never been offered for sale, at least not under its correct name. Maybe Bill would consider propagating this plant and offering it for sale to those who would like to grow it.

LETTERS TO THE EDITOR:

Letter received 23 Jan 99 from Donna Linsley

109 Benedict Road
Pittsford, New York 14534
January 18, 1999

I have followed with interest the discussions of finding orange in the lutea tree peony. I have a P. lutea from Galen Burrell which turned out to be atypical of the species. His original list described it as, "Paeonia lutea - wild tree peony that is very similar to P. delavayi, but is slightly shorter (2-4 feet), has more finely dissected leaves, and has bright yellow flowers. 0011 - These came to me as seed from various botanical gardens. Those that have flowered have greenish-yellow flowers. Large 3 year old plants."

In my climate, near Rochester, New York, this plant did not come up in the spring when all the other peonies start growth, usually in May. I thought it was a goner, when surprisingly in July it sprouted and began to grow. It spreads underground and wanders, never gets over about 1 foot tall here and tends to get fungus on the leaves which turn black. But when it blooms, it is a real charmer, deep gold with orange edging around the dainty, side facing, 2 inch flowers which have a lovely rich fragrance. Galen's comment, when I sent him the picture was, "your lutea, which I guess was from me? is a p. lutea x P. delavayi hybrid. Supposedly, in the wild, plants with rust or orange-colored flowers are common."

I also have a P. delavayi from Galen which he described as, "wild tree peony with dissected leaves and dark maroon to red flowers. Grows to 4-5 feet tall. It will bloom in fairly dense shade but does best in partial sun. It does not, however, like a hot, south-facing location without shade. (For growing tips and photograph see summer 1995 issue of Pacific Horticulture). 0008 - Two year old plants. Seed from various botanical gardens."

This plant is much more like a regular tree peony in size. It has coarse thick stems about 4 feet tall. It also spreads widely from the base. Once it had rebloom in the fall. The flowers are small; however, they are larger than the above mentioned lutea, but very fragrant. I grow it on a raised bed in full sunlight with an eastern exposure and it seems quite happy despite the fact that this is exactly the opposite of what Galen describes as the ideal site for Delavayi. Its flowers are not red or maroon but what I would call gold, shading to orange. I will try to get some good photos this spring.

I also have a photocopy of Professor Saunders tree peony notebook. He makes frequent reference to crosses such as *Marchioness* - L.D. x mixed t.p. or *Banquet* - L.D. x crimson t.p.; others are *Roman Gold* - lutea x white t.p.

I asked Mr. Nassos Daphnis, who was a guest at Lee Gratwick's annual Memorial Day tree peony open house weekend at Linwood Gardens in Pavilion. N Y, what he thought L. D. stood for in the notebooks. He thought it was probably lutea x delavayi. Wister in The Peonies says, Professor Saunders procured plants of P. lutea and P. delavayi and began his work ..." p. 169. On the same page he says the crosses were made by saving the pollen of moutan varieties and putting it on the later blooming p. lutea and p. delavayi. Given Professor Saunder's hybridizing skills, it seems entirely possible that he crossed lutea and delavayi and used the resultant hybrids in his tree peony work.

Anyway, it seems that crossing lutea with delavayi or the reverse may very well give you the orange you are seeking. I seem to have two when orange was not my goal at all, I wanted a

true red and a yellow. Flowers are small, so a lot of hybridizing would be needed to get large doubles, if that is the goal.

Somehow, for me the species peonies have a subtle charm all their own. I would also hate to see the wonderful fragrance present in them bred out.

Another interesting note is that my P. delavayi seems to be fertile when crossed with P. peregrina. Two years in a row, seeds of the cross have been produced. None have yet sprouted, but the seeds seem to be large and healthy and well formed, sinking when rinsed with Clorox solution prior to planting. The reverse cross has not been productive. However, this is not a great surprise since P. peregrina is such a fussy plant, hating to be moved, hating too much sun and pouting and refusing to bloom for years where it is not happy.

I am enclosing a photo of my lutea, which I would like to have returned as it is my only copy. To me it seems to have a lot of orange, please let me know what you think.

Sincerely,

Donna J. Linsley

P. S. The Saunders tree peony notebooks do state the crosses for the some of the Black Pirate group.

Daredevil 14344 was L. D. x pink t.p.
Phoenix 12726 was L. D. x mixed t.p.
Black Douglas (originally Typhoon) 11995 was L. D. x Hatsu Garasa
Black Pirate 8021 was Delavayi x cherry red t.p.
Corsair 12710 was L. D. x Rochester Black
Red Jade 13032 was L. D. x Rochester Black

Professor Saunders had an impressive collection of both Japanese and European tree peonies. I enclose a copy of the Japanese list and am typing the European ones. *Satin Rouge, L'Esperance, Flambeau, Surprise, Mme. L. Henry, Souvenir de Maxime Cornu, La Lorraine, lutea superba, Alice Harding* which unfortunately was procured and died in 1941. Also *Jeanne D'Arc, Mme. Stuart Low, Souvenir D'Etienne Mechin, Reine Elizabeth, Cascade #360*, #75 pink Jap, #45 Salmon Jap, *Marie Stuart* and the lovely sounding *Noelle de Mosa #166* which notes say was named for a dancer. There is also mention twice of progeny of t.p. *Indian Springs*.

Although I have never seen it available for sale, the gorgeous clear red of *Orihime*, which was in bloom at Linwood Gardens, is something I am trying to obtain.

Linwood Gardens (the former William Gratwick Nursery) is well worth a visit, if anyone is in the East in May. The address is

Lee Gratwick
1912 York Road
Pavilion, N.Y. 14525 USA
Telephone 1-716-584-3913

as stated on p. 35 of the June 1997 bulletin of the American Peony Society, this is a private residence, not a public garden, but there is usually an Open House on Memorial Day weekend. A few plants are available for sale from the nursery. The grounds offer magnificent mature tree peonies in all colors of the rainbow.

Letter received 14 Sep 98 from Anne Oveson

Dear Mr. Smith

In regard to fragrant red lactifloras, both Big Ben and Karl Rosenfield have a strong, pleasant rose fragrance. Twenty six (13%) of my two hundred peony varieties are fragrant. Several hybrids are among the group, although their fragrances are not as strong as the straight lactis.

Some time ago, it was reported I had success in crossing P. brownii with other pollens. I've had good luck in getting pods and even plants - seedlings - with several pollens, but haven't been successful in getting them to do much more than send out a small leaf and very short root before they die off. I think a friend was more successful - at least his seedlings lived until normal die-down time for P. brownii. Next year should tell. I've had seed pods from species pollens, but P. brownii blooms starting in late April for me and unless a friend sent me pollen, I'd have only *Rose Crystal* (sterile hybrid, as far as I can tell), *Early Windflower* and a few others to work with. Galen Burrell's seedling from his *Anika* gave a pod on P. brownii, but that was this spring and I don't have any idea if they will germinate let alone grow. I'm going to try Teresa Griesbach's suggestion in Vol. 28, No. 2 to see if gibberellic acid will help.

I know of several persons having seedlings from P. brownii pollen. Don't know if any have bloomed yet. Their plants are several years old. I don't have any yet, although I planted seeds from 6 crosses last month - P. brownii x 6 varieties - species & lacti hybrids. My pods with P. brownii pollen are not ripe yet - there are 7 out of 24 attempts mostly from varieties that I haven't tried before. P. brownii has rather sparse pollen- however, plenty to give as many as 20-30 seeds per blossom.

Many of my crosses are made in the hills at higher elevation on our range land, where elk really wreak havoc by knocking off wire cages, slash from logging, mesh, etc. to get to the plants. They really go after P. brownii, including nearly ripe seed pods. This area is about 4 miles from my home and the plants there are scattered over many acres. It's difficult to locate the plants and get them pollinated at just the right time. In this area, the plants bloom 2 weeks or so later and ants cut off the anthers and appear to do much of the pollenating. I see very few bees or other insects. Wind may be a factor. P. brownii pods ripen here (at 3000') in late July and I've never had a seed germinate after more than the first winter.

P. brownii is scattered over many areas in Wallowa County (North-eastern Oregon- adjoining both Wash. and Idaho). In one area that is 80-90 miles away, they bloom in June and seed ripens in early September, at 6500'.

My prime objective in using P. brownii is to get more hardiness against spring frosts. They only send one leaf the first year, two the second, and then the third year, they begin to grow.

My first cross was *Early Windflower* x P. brownii. Then, I read that *Early Windflower* didn't set seeds and P. brownii couldn't be crossed with anything so I took off my markers. Believe I got one seed that didn't germinate, but a second one did. Now, I have a nice plant from this one. It's fertile both ways, but stingily so.

I know my crosses on P. brownii were not contaminated in several instances as the cotyledons that germinated varied from straight P. brownii - P. potanini- shorter cotyledons - P. peregrina had a thin blade with the cotyledons. I sure hated to have them die.

Yours truly,

Anne Oveson

Letter received 5 Jan 1999 from Nassos Daphnis

Dear Mr. Smith

Thank you for sending me your recent newsletter. I was interested to see that many hybridizers today are interested in breeding for orange flower color in the tree peonies. So far the closest to orange is *Tessera*, a cross that I made in 1946, more than 50 years ago. *Tessera* is from the 4 th cross that I made.

During my 50 years of crossing tree peonies, I have made about 400 successful crosses. From all these, I have selected only about 40 varieties for introduction. About 1 in 10. My main interest was to select flowers that had the right color, form and substance to the highest degree of perfection.

Another interest was to overcome the sterility of the F1 hybrids. It was important to me to advance these hybrids to the 2nd and 3rd generations were the fertility would be set in. On these advanced generations the pollen produced and the female reproductive cells are comparable to unite. However, this is only achieved on the advanced generations such as ***Nike***, ***Pluto***, ***Boreas***, ***Hesphestos***, ***Clyde***, ***Urania*** and many others. The important thing is that the pollen from these plants can be used on all the other generations. This way one has the gene pool of all the previous parents.

I wish all this material was available to me 50 years ago. When I started in 1946, I had only Lutea as a mother plant and Moutan as the father plant. The breakthrough came when I used fertile pollen from a Saunders F2 plant back on the F1s, creating the BC (back cross) hybrids. From that point on, the possibilities were tremendous. These plants also had fertile pollen and could be used on all the plants from different generations.

I hope that the new hybridizers take advantage of all these possibilities. Who knows what great flowers will appear in the future.

With best regards,

Nassos Daphnis