

is going to speak to us today on the genus *Pyracantha*. Incidentally, if he can straighten out this group of plants so we all know what we are talking about, he should be a candidate for the Colman Award for the next ten years

Without further ado, I present Francis de Vos.

Mr. Francis de Vos presented his paper. (Applause)

CULTIVATED FIRETHORNS

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Firethorns are by all odds the most colorful shrubs in the autumn landscape of the southeastern states. Briefly challenged by the autumnal foliage of a myriad of deciduous shrubs and trees, they outlast their competitors and remain the cheeriest plant in the drab landscape of early winter. Today, I shall review with you the landscape merits of the various species and varieties and show you color slides of many of them.

The genus *Pyracantha* is closely related to such genera as *Cotonaster*, *Crataegus* and *Mespilus*, and has been assigned at different times to one or the other of these genera. The genus is also closely related to *Osteomeles*, with which it has been hybridized to produce the monotypic bigeneric genus *Pyracomeles vilmorini* (*Pyracantha crenatoserrata* x *Osteomeles subrotunda*). Despite the closeness of the genus *Pyracantha* to its related genera we have the most difficulty in determining the true identity of specimens at the species and cultivar level.

Let us take a closer look at the six species of *Pyracantha* that are in cultivation in this country to see how the typical forms differ from one another.

Pyracantha angustifolia is native to China and is perhaps the most tender of the species. The tomentose condition of the under surface of its leaves and of its calyces clearly set this species apart from the other species, which are essentially glabrous. Typically a broad-spreading shrub reaching a height of 10 to 12 ft, it does, on occasion produce some prostrate branches. Its fruit are orange-yellow and flattened on the ends.

Pyracantha atalantioides (*P. gibbsii*), also native to China, makes a very strong upright-growing shrub 15 to 20 ft in height. This species is frequently referred to as the Gibbs firethorn (*P. gibbsii*), because it was named after the Hon. Vicary Gibbs, in whose garden in England there was a magnificent specimen. Later nomenclatural studies, however, revealed that *P. atalantioides* was the first name to this species and should take precedence over *P. gibbsii*. The most distinguishing features of this species are its leaves which are larger than those of other species, ranging up to 3 in. in length, and the long-lasting quality of its fruits. The bright-red fruits are said to stay in good condition until late winter.

Pyracantha crenato-serrata (*P. yunnanensis*) is closely related to *P. atalantioides* and can best be distinguished from it on the basis of leaf differences. The leaves of *P. crenato-serrata* are widest above the middle, toothed, and green beneath, whereas the leaves of *P. atalantioides* are widest at or below the middle, usually entire, and slightly glaucous beneath. *P. crenato-serrata* is native to Yunnan Province, China, and was introduced into France in 1906. It is said to retain its red fruits well into spring.

Pyracantha crenulata is native to the temperate regions of the Himalayas. Although it is probably more closely allied to *P. coccinea*, from which it differs by its glabrous instead of pubescent corymbs, it may more frequently be confused with *P. crenato-serrata*. It differs from the latter in that its leaves are less rounded at the apex. The fruit of this species range from orange-red in the species to yellow in the variety *P. crenulata flava*.

Pyracantha coccinea, especially the hardy upright form *P. coccinea lalandi*, is the most widely grown of the species. It is native to southern Europe and Asia Minor and makes a typically broad-spreading shrub up to about 20 ft. in height. It can be distinguished from *P. angustifolia* in that its leaves are only slightly pubescent beneath. The fruits of the species are bright red and those of the more popular *P. coccinea lalandi* are orange-red.

Pyracantha koidzumi (*P. formosana*) is the most widely grown species in the southeastern states. Since this Formosan species is precariously hardy in Washington, D.C., it is not usually found in northern gardens. The bright-red fruits of this species are borne in great profusion and last until early spring if left unmolested by birds. It can be distinguished from *P. crenato-serrata* by its entire leaves and from *P. atalantioides* by its smaller leaves which are green beneath.

Although the species seem to be reasonably distinct, it is difficult and frequently impossible to determine the true identity of specimens growing in our gardens. There are three reasons for this: (1) Plants raised from seeds of open-pollinated flowers are variable in foliage and habit, and seeds from red-fruited varieties often give rise to yellow-or orange-fruited forms; (2) since the chromosome number is probably the same for all species, seeds collected from plants growing in collections containing more than one species are likely to give rise to interspecific hybrids that are intermediate to both parents in many of their characters; (3) the color and size of fruits can differ markedly when the plants are grown under various cultural and light conditions.

In evaluating firethorns for landscape use as specimen shrubs, for espaliering, or for hedges, one should consider the following factors in addition to the aesthetic qualities of their fruit and foliage:

- (1) *Hardiness*. For many years *P. coccinea lalandi* has been the standard for all supposedly cold-hardy firethorns. More recently other hardy varieties such as 'Kasan' and 'Royal' have been offered by the nursery trade.
- (2) *Resistance to Fire blight*. This ever-threatening disease of most rosaceous plants can raise havoc with firethorns. The hybrid *P. 'Oxford'* (*P. angustifolia* x *P. crenato-serrata*) is said to be very resistant.

- (3) *Lasting qualities of the fruit.* Many varieties retain their fruits (if the birds leave them alone) until Christmas time. The varieties 'Kasan' and 'Victory' are reported to retain their fruits into late winter.

It is not possible at this time to evaluate fully the different varieties separately for use on a country-wide basis, because test collections have not been established in the various climatic regions across the country. Information is, however, accumulating as individuals and nurserymen try the newer varieties in their particular areas. I shall now describe some of the varieties and comment on those on which I could find specific information.

1. *Pyracantha angustifolia*
 - a) Fruit color-orange-yellow to red, b) Hardiness zone-8, c) most easily distinguished species because of its tomentose leaves. Plants apparently not available in this country.
2. *Pyracantha atalantioides* (*P. gibbsii*, *P. discolor*)
 - a) Fruit-red, b) Zone 6, c) Upright growing species with large leaves and fruits which persist into late winter.
3. *Pyracantha atalantioides* 'Bakeri'
 - a) Fruit-red, b) Zone 6, c) No description available, but listed as available from nurseries in the Plant Buyer's Guide.
4. *Pyracantha atalantioides bellii*
 - a) Fruit-red, b) Zone 8, c) Similar to *P. koidzumii*, but with large and better distributed fruits.
5. *Pyracantha atalantioides* 'Cal Poly'
 - a) Fruit-red, b) Zone 8, c) Said to have showy pink flowers. Vigorous.
6. *Pyracantha coccinea*
 - a) Fruit-red, b) Zone 6, c) Most widely grown species in the northern states especially its hardy form *lalandii*.
7. *Pyracantha coccinea aurea*
 - a) Fruit-yellow, b) Zone 6, c) Yellow fruiting form of *coccinea*.
8. *Pyracantha coccinea* 'Kasan'
 - a) Fruit-orange-red, b) Zone 3, c) Hardier and supposedly a heavier fruiter than *P. coccinea lalandii*.
9. *Pyracantha coccinea lalandii*
 - a) Fruit-orange-red, b) Zone 4, c) Most widely planted firethorn in the northern states but will probably be replaced by 'Kasan.'
10. *Pyracantha coccinea lalandii* 'Monrovia'
 - a) Fruit-orange, b) Zone 5, c) Has long arching branches and glossy foliage.
11. *Pyracantha coccinea lalandii* 'Royali'
 - a) Fruit-red, b) Zone 4, c) Distributed by M. G. Coplen of Rock Creek Nurseries, Rockville, Md.
12. *Pyracantha coccinea lalandii* Thornless
 - a) Fruit-orange, b) Zone 4, c) Thornless variety of *lalandii*.
13. *Pyracantha coccinea lindleyana*
 - a) Fruit-orange, b) Zone 6, c) Seedling of *P. coccinea* with spreading habit and light green leaves. Distributed by Lindley Nurseries, Greensboro, North Carolina.

14. *Pyracantha coccinea pauciflora*
a) Fruit-unknown, b) Zone 4, c) Low growing, spreading form. Sparse fruiting
15. *Pyracantha crenato-serrata* (*P. yunnanensis*)
a) Fruit-red, b) Zone 7, c) Matures its fruit later in fall than other species and retains them in good condition until early spring.
16. *Pyracantha crenato-serrata* 'Graberii'
a) Fruit-red, b) Zone 7, c) Produces very large fruits in great clusters. Very popular in the Norfolk, Virginia area.
17. *Pyracantha crenato-serrata macrocarpa*
a) Fruit-unknown, b) Zone unknown, c) No information available.
18. *Pyracantha crenato-serrata prostrata*
a) Fruit-unknown, b) Zone unknown, c) No information available
19. *Pyracantha crenato-serrata* 'Rosedale'
a) Fruit-red, b) Zone 7, c) Equally as showy as 'Graberii' with smaller but glossier fruits and in somewhat looser clusters.
20. *Pyracantha crenato-serrata yunnanensis*
a) Fruit-unknown, b) Zone unknown, c) No information available.
21. *Pyracantha crenulata*
a) Fruit-orange-red, b) Zone 6, c) Small-leaved species with lustrous small fruits
22. *Pyracantha crenulata* 'Crimson Tide'
a) Fruit-red, b) Zone 6, c) No description available, but listed as available from nurseries in Plant Buyer's Guide.
23. *Pyracantha crenulata flava*
a) Fruit-yellow, b) Zone 6, c) Bears an abundance of small glossy yellow fruits.
24. *Pyracantha crenulata kansuensis*
a) Fruit-orange-red, b) Zone 6, c) Strong, upright growing shrub bearing an abundance of glossy orange-red fruits. Foliage small.
25. *Pyracantha crenulata rogersiana* (*P. c. aurantiaca*)
a) Fruit-reddish-orange, b) Zone 6, c) The varieties of *Pyracantha rogersiana* of some authors are probably the same entities that are listed under the same varietal names under *Pyracantha crenulata*, e.g. *P. c. flava* is probably the same as *P. rogersiana flava*.
26. *Pyracantha crenulata rogersiana angustifolia*
a) Fruit-unknown, b) Zone 6
27. *Pyracantha crenulata aurantiaca*
a) Fruit-reddish-orange, b) Zone 6
28. *Pyracantha crenulata rogersiana flava*
a) Fruit-yellow, b) Zone 6
29. *Pyracantha crenulata taliensis*
a) Fruit-yellow, b) Zone 6, c) Produces shining yellow fruits which drop in late fall.

30. *Pyracantha Duvali*
 - a) Fruit-red, b) Zone 5, c) Hybrid between *P. koidzumii* x *P. crenato-serrata*. It is said that birds will not eat the fruit.
31. *Pyracantha* 'Ingleside Crimson'
 - a) Fruit-red, b) Zone unknown, c) Seedling selection. Bears profuse clusters of large red berries. Distributed by Ingleside Farm Nurs., Oak Grove, Virginia.
32. *Pyracantha koidzumii* (*P. formosana*)
 - a) Fruit-orange-red, b) Zone 7, c) Most widely grown species in the southeastern states.
33. *Pyracantha koidzumii* 'Eddie's Coral'
 - a) Fruit-unknown, b) unknown, Zone, c) No description available, but listed as available from nurseries in Plant Buyer's Guide.
34. *Pyracantha koidzumii* 'Government Red'
 - a) Fruit-red, b) Zone 8, c) Fruits color in early fall. One nursery catalog states that it is hardy in Zone 5.
35. *Pyracantha koidzumii* 'Low Dense'
 - a) Fruit-orange-red, b) Zone unknown, c) Low dense seedling form of *P. koidzumii*, practically thornless. New growth covers fruit. Killed back to ground at the Arboretum in winter of 1958.
36. *Pyracantha koidzumii* 'Pannosa'
 - a) Fruit-unknown, b) Zone unknown, c) No description available, but listed as available from nurseries in Plant Buyer's Guide.
37. *Pyracantha koidzumii* 'Red Berry'
 - a) Fruit-red, b) Zone unknown, c) No description available, but listed as available from nurseries in Plant Buyer's Guide.
38. *Pyracantha koidzumii* 'San Jose'
 - a) Fruit-red, b) Zone 7, c) Reported to bear the largest fruits—up to 5/8" in enormous clusters.
39. *Pyracantha koidzumii* 'Santa Cruz'
 - a) Fruit-red, b) Zone 8, c) No description available, but listed as available from nurseries in Plant Buyer's Guide.
40. *Pyracantha koidzumii* 'Santa Cruz' prostrata
 - a) Fruit-red, b) Zone 8, c) Prostrate growing habit
41. *Pyracantha koidzumii* 'Sensation'
 - a) Fruit-red, b) Zone 5, c) Said to be a *coccinea* hybrid which sets an abundance of scarlet red-fruit and is compact in habit.
42. *Pyracantha koidzumii* 'Stribling'
 - a) Fruit unknown, b) Zone unknown, c) No description available, but listed as available from nurseries in Plant Buyer's Guide.
43. *Pyracantha koidzumii* 'Victory'
 - a) Fruit-red, b) Zone 8, c) Large berried form which colors late but retains its fruits into late winter.
44. *Pyracantha koidzumii* 'Walderi'
 - a) Fruit unknown, b) Zone unknown, c) No description available, but listed as available from nurseries in Plant Buyer's Guide.

45. *Pyracantha koidzumii* 'Walder' prostrata
 - a) Fruit-red, b) Zone 8, c) Prostrate form which bears large red fruits in clusters.
46. *Pyracantha* 'Oxford'
 - a) Fruit-orange to red, b) Zone unknown, c) Hybrid of *P. angustifolia* x *P. crenato-seriata* Said to be more resistant to fire-blight.
47. *Pyracantha* 'Pride of Portsmouth'
 - a) Fruit-red, b) Zone 7, c) Named by John Coleman of Portsmouth, Virginia. Bears extremely large clusters
48. *Pyracantha* 'Runyan'
 - a) Fruit-orange-red, b) Zone 5, c) Probably a seedling of *P. coccinea*.

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MODERATOR FLEMER: Thank you very much, Mr. de Vos. The floor is now open for questions

MR. JAMES WELLS (Red Bank, New Jersey): I feel constrained to point out there is one serious omission, *Pyracantha wateri*. However, that wasn't my reason for getting up here. I can give a little information on some of these varieties.

Pyracantha coccinea 'Lowboy' was raised by Don McLaughlin, who is neighbor of mine in Red Bank, New Jersey and as far as I know is a seedling of *P. coccinea*. It has been my observation that it is not a very steady fruiter as a young plant.

Pyracantha coccinea lalandi 'Royali' was, I believe, named by Joseph Gable. The original plant came from his garden at Stewartstown, Pennsylvania. It is supposed to be a seedling of *P. coccinea lalandi*, and I have had word from a number of people that when planted in the Midwest area alongside *P. c. lalandi*, it will stand up when *P. c. lalandi* is killed.

MR. de VOS: Thank you for those comments. If any of you know the background of some of these plants we certainly would appreciate your telling us.

PRESIDENT STEAVENSON (Elsberry, Missouri): I would like to ask if anyone knows how long it takes for firethorns to bear when grown from seed? Several years ago I grew quite a number of plants of *P. coccinea* from seedlings and put them in pots. Eventually I got them into the field where they grew for about six years without fruiting. I finally gave up in disgust and dug them out.

MEMBER: It has been our observation that some of them may bear fruit in five years while others take ten years. Some varieties are twenty years old before they bloom and bear fruit

MR. J. PETER VERMEULEN (Neshanic Station, New Jersey): A comment on 'Lowboy.' We have some of the original plants from Don McLaughlin and they have been fruiting quite heavily.

MR. DEWILDE (Shiloh, New Jersey): To comment on *Pyracantha crenulata angustifolia*, I might say that it has yellow fruit.

(Editor's note: Mr. Edward Scanlon, Chairman of the Awards

Committee showed a colored slide of the plaque presented to Dr. F. L. Skinner for his outstanding work in the field of plant propagation.)

MODERATOR FLEMER Thank you gentlemen, we must now continue with our program Our next speaker, to continue the subject of firethorns, is Judson P. Germany, Jr., of Germany's Nursery, Fort Worth, Texas, who grows *Pyracantha* on a large scale. He will speak to you on "Propagation of *Pyracanthas* in the Greenhouse and Mist Bench."

Mr. Germany read his prepared paper. (Applause)

PROPAGATION OF PYRACANTHA IN THE GREENHOUSE AND MIST BENCH

JUDSON P. GERMANY, JR

Germany's Nursery

Fort Worth, Texas

INTRODUCTION

The firethorns have long been an important group of ornamental plants to commercial nurserymen in almost every section of the country. There are few plants available today which combine evergreen or semi-evergreen foliage with a showy display of white flowers in the spring, followed by a massive array of deep red or bright orange berries in the fall. While most people are attracted to firethorns because of their heavy berry production, many are discovering that they are also good subjects for training as espaliers, into tree forms and other exotic shapes. They can be used as screens, foundation plants, or in mass plantings. There are dwarf forms and prostrate forms. For those who appreciate variegated plants, there is at least one very interesting variegated variety.

Just as the flowers and fruit of this group of plants have made them extremely popular in the past, the versatility of old varieties put to new uses and the introduction of new forms almost yearly is certain to boost their popularity to even greater heights in the years to come. Already there are available orange berried varieties which promise to extend the culture of these plants into all but the very coldest sections of the United States. The red berried varieties are still confined to the warmer sections of the country, but improved varieties are gradually moving into the northern latitudes year by year, and the time will come, no doubt, when hardy red berried varieties will be available that can be grown right alongside the orange berried kinds.

For the next few minutes I will outline the methods and describe the facilities we use at our nursery to propagate firethorns from cuttings. I believe you will find that the techniques we use are no different from those used in the average nursery for the propagation of most, common, broad-leaved evergreens.

Almost any type of propagation structure can be used for the propagation of firethorns, as they are among the easiest of plants to produce from cuttings once a few simple requirements are met and understood. However, for ease of management and for almost certain results, I