

FRIDAY AFTERNOON SESSION

December 4, 1964

The session convened at 1:15 p.m. in the Ballroom, Manger Hotel. Mr. Ralph Shugert, moderator.

SPEAKER - EXHIBITOR SYMPOSIUM

MODERATOR SHUGERT: The first speaker this afternoon is Professor Joseph C. McDaniel from the University of Illinois.

A LOOK AT SOME HACKBERRIES

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While hackberries have been relegated to a place of little importance by most recent writers on ornamental trees, I believe it is time that propagators gave a fresh look at some of the things available in the genus *Celtis*.

I have been doing this, particularly in east central Illinois, since the elm diseases took practically all our native *Ulmus* off the local streets. We can see now a great many old and younger hackberries, which offer much as hardy, adaptable shade trees for yards, streets and roadsides. Many of them, in my opinion, give a better year-round effect than *Ulmus americana*, and some clones are very elm-like in general habit. These include some *C. occidentalis* which are but slightly affected by the hackberry witches'-broom disease. *C. laevigata*, native in southern and extreme western Illinois is another species of promise, almost never disfigured by witches'-broom. Besides these two, I shall mention some other species with ornamental potentialities for eastern and southern North America.

Celtis appears to be easily the largest woody genus in the *Ulmaceae*. Rehder's Manual of Cultivated Trees and Shrubs discusses seven genera in this family, only *Ulmus* and *Celtis* with more than five species each. *Ulmus*, with a world-wide distribution of about 18 species, has had the major share of horticultural attention. But *Celtis* has around 70 species, north temperate, tropical, and some even south-temperate. A few each from North America and temperate east Asia seem most worthy of our attention as ornamental trees in the 1960's.

Let's look at native and introduced trees of *C. occidentalis* in central Illinois before moving on to one of its varieties, and then to other species.

The most northern and one of the most widespread species of *Celtis* in our region is *Celtis occidentalis*, with its variant forms. The eastern Illinois trees that I am showing in the slides are generally of the variety that most of the botanists

twenty to fifty years ago (including Rehder and Sargent) would have called *C. occidentalis* var. *crassifolia* Gray. But in Gray's Manual of Botany (8th ed. 1950) by M. L. Fernald, the so-called *crassifolia* is made synonymous with the type, *C. occidentalis* L. The other two varieties treated by Fernald have thinner, smoother leaves than the type, and one of them var. *pumila* (Pursh) Gray, is frequently only a shrub. The other, var. *canina* (Raf.) Sarg., may be a shrub, or sometimes as tall (30 M.) as the type.

Fernald, along with other taxonomists, mentions the difficulty of separating species and botanical varieties in *Celtis*. He writes, "The N. Amer. species and varieties too often seem . . . confluent. Fully mature fruit is important for identification." Under *C. occidentalis*: "Exceedingly variable, passing freely from one var. to another and suspected of hybridizing" with two other American species. "The best marked varieties" in Fernald's classification, include typical *C. occidentalis* (or *crassifolia* of other authors) with generally larger, scabrous, gradually acuminate leaves, nearly spherical orange-red to fuscous drupes, with shorter pedicels (0.3 to 1.5 cm.) compared to those of vars. *pumila* and *canina* var. *pumila* and var. *canina* both have larger pedicels (0.8 to 3.5 cm.), smooth, more or less membranaceous leaves. They are differentiated from each other principally by their leaves, which in var. *pumila* are conspicuously inequilateral and averaging more than half as broad as they are long, those on fruiting branchlets 3 - 9 cm. broad at base, while those of var. *canina* are more nearly equal-sided, with ovate-lanceolate blades averaging less broad and running on fruiting branchlets 1.5 to 9 cm. broad at base. On all varieties, leaf dimensions on non-fruiting shoots, and especially on young trees, may considerably exceed Fernald's average for the species of 8 by 4.5 cm. Fernald says the stature of the species is "greatly varying in response to habitat." Without denying the environmental influence, I'd say also, "Look for genetic variability, and propagate from trees that have made good specimens in the kind of habitat your stock is to be planted in."

In recent years, some hackberries have been planted on our campus and on streets of new subdivisions in Urbana. Unfortunately for the landscape, these were not of the local race of typical *C. occidentalis* native around Urbana. They more agree with var. *canina*, and if I had only these recently planted trees to judge hackberries by, I'd tend to agree with Dr. Donald Wyman that they have "nothing especially to recommend their use where better and more attractive trees are available." (Trees for American Gardens, p. 151.) Better hackberries were available around Urbana, but the planters went farther and fared worse.

Here's one of the var. *canina* trees that I have watched for several years, at the Urbana Junior High School. The following picture, taken just across the street on the same October

day, shows a typical vigorous seedling of the Urbana race of *C. occidentalis*. Next, a few views of planted trees, also probably var. *canina*, on the University campus. Some of them may turn out better than the one by the Junior High, but not as good as the old local seedling next shown in the foreground.

Several of the older, local race trees of *C. occidentalis* around Urbana and Champaign look good enough to be considered for clonal propagation. In view of the miscellaneous material now grown as nursery seedlings, and the inferiority of many of them, I believe that the nurseryman who wants to offer a superior hackberry will eventually take up clonal propagation. Here is one of my candidates for grafting: a tree in Urbana that has the aspect in general of a good type of American elm. Note its pendulous secondary branches. This one and many of our other older hackberry trees in Champaign County and near there are almost free of the disfigurement due to the hackberry witches'-broom condition.

Celtis laevigata Willd. is another species native in the southern half or more of Illinois, but not the Urbana area. It is the prevailing *Celtis* in the lower Wabash Valley, and southward to the Florida Keys, Bermuda, and Nuevo Leon, Mexico, north to Oklahoma, southeast Kansas, Missouri (above St. Louis) and to the coast of Virginia in the eastern states. (Its synonym is *C. mississippiensis* Bosc.) Here are some views of specimens in Cairo, Illinois and in eastern Missouri, taken in the first week of October. Then two trees planted in Decatur and Urbana, Illinois, in Zone 5, where Wyman rates it hardy. Wyman includes this one American species among his recommended hackberries, "because it is a widely found native tree, very resistant to the witches'-broom disease . . . and widely used as a street tree in the South." It has, I think, an interesting trunk, with its irregular corky protrusions in the bark.

One view shows the good union of a graft I made, of *C. laevigata* on *C. occidentalis* at Urbana. *C. laevigata* is also a variable species as to form, and we could select more weeping or irregular, or more upright and dense-headed clones for propagation. Far-southern sources of it may lack hardiness with us in Zone 5.

Propagators who want to try grafted hackberries might use seedling stocks of *C. occidentalis* or whichever species is available and hardy in the nursery area. Another combination I found compatible fifteen years ago at Nashville, Tennessee, was *C. sinensis* on stocks of *C. laevigata*. The latter is one of the commonest of all trees in Nashville. I used chip buds in late summer. According to Hortus Second, *Celtis* may also be propagated by cuttings in the fall. I have not seen it tried with summer mist methods, though Hartmann and Kester (in Plant Propagation, 1959) say both *C. occidentalis* and *C. laevigata* can be started by cuttings.

Some botanical varieties of *C. laevigata* include var. *Smallii* (Beadle) Sarg., common in its eastern range and different prin-

cipally in retaining leaf serrations on the mature tree. From southwestern Missouri to New Mexico, a bushy tree or shrub form is var. *texana* Sarg. Some recent authors include a farther western var. *reticulata*, the netleaf hackberry, ranging from western Texas and possibly Washington state to southern California. (Rehder and Sargent called it *C. reticulata* Torr.) It has been recommended as a desirable native small tree species for southern Arizona landscape use. Steve Fazio, member of the Western region of the Society, and acting head of the Department of Horticulture at University of Arizona, sent me the views I show of desert hackberry in the Tucson area.

Some of the exotic species of hackberry have been cultivated at least to a limited extent in Georgia and California, and in arboreta elsewhere in the U.S. These include *C. simensis* Pers., now well naturalized at Davis, California, and *C. australis* L., the European hackberry, listed by Hortus Second as being grown in southern California. (Fazio does not know of any in southern Arizona plantings.) These probably are both more tender than the midwestern forms of *C. laevigata*.

Here in one of the Rochester parks, I've seen and liked *C. Bungeana* Bl., native to China and Korea. It would be my first choice of foreign hackberries to try in Zones 5 and 6 of the eastern states and Ontario. Wyman in his book, *Trees for American Gardens*, writes, "In general this species performs the best of those in the Arnold Arboretum . . . it is as yet unavailable from commercial sources." He also recommends another Asiatic species, *C. jessoensis* Koidz. from China and Japan. *C. jessoensis*, he says, is "possibly of value as a substitute for the American elm."

MODERATOR SHUGERT: Thank you very much. It certainly was well done. Our next speaker, speaking on *Crataegus* root stock studies at the Morden Experimental farm, a gentleman we are very proud and pleased to hear this afternoon, is W. A. Cumming who is the head of the Ornamental Section of the Canadian Department of Agriculture from Morden Manitoba.

CRATAEGUS ROOTSTOCK STUDIES

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In 1949 we introduced Toba hawthorn which was the result of a cross between *Crataegus oxyacantha* 'Paul's' Scarlet' and the native species *Crataegus succulenta*. This new cultivar gained recognition quickly in those areas where nurserymen were already propagating hawthorn cultivars and had a reasonably satisfactory rootstock available. On the Canadian prairies, from whence it was introduced, its performance was disappoint-