An article entitled "A Solution to Blackline in Walnuts" was published by Extension Horticulture Specialist Dr. Robert L. Stebbins from Oregon State University in the July-August 1983 issue of Nut Grower Magazine. In this article, Dr. Stebbins indicated that blackline was no longer a problem in Oregon because the Manregian rootstock, a seedling Juglans regia, was an entirely satisfactory walnut rootstock in Oregon. The Manregian is a U.S. plant introduction, PI 18256, a J. regia walnut biotype from Manchuria. Reference is also made in the article to a test conducted between 1970 and 1973 by USDA Horticulturist Dr. Harry B. Lagerstedt and OSU Extension Agent Wayne Roberts in which Franquettes on Manregian and on J. hindsii planted in 1968 on alternate rows were compared for growth and yield characteristics. The report by Dr. Stebbins indicates that Manregian-rooted trees consistently grew more rapidly than trees on J. hindsii. After five years, trees on J. hindsii were about 60% as large as trees on Manregian. Dr. Stebbins indicates that in 1983, after 14 years, he found no cases of blackline on either rootstock in this orchard. This orchard was the Bert Coleman orchard, now owned by Evergreen Helicopters.

Dr. Stebbins also reported that in an orchard near Wheatland Ferry, southeast of McMinnville in Yamhill County, few of the original trees on J. hindsii roots have survived. Most of the old trees on J. hindsii are in various stages of decline due to blackline and many have been replaced by Manregian. This orchard was planted by Bert Wepster and is now owned by Evergreen Helicopters.

During the 1984 walnut workgroup meeting in Modesto, we discussed the possibility that Persian rootstocks, including Manregian, might be a solution to blackline in California. I planned to be in Oregon in August and volunteered to investigate the use of Persian rootstocks in walnuts.

I contacted Wayne Roberts, County Agent in Yamhill County, Dr. Bob Stebbins, and Dr. Harry Lagerstedt, who also sent information on test plot work done in Oregon.

On August 2nd, I talked briefly with Dr. Bob Stebbins about walnut and the Manregian rootstock in Oregon. He indicated that the Manregian had worked out well for them in Oregon, but the industry was declining. There are few, if any, new plantings. Many of the older orchards have died out. Few black walnuts are left, so direct comparisons are difficult to make.

Dr. Stebbins says that the Manregian nut on trees which are seedlings from the original plant introduction source are very round nuts and have hulls with prominent white flecks. He indicated that this is quite characteristic and should be an identifying characteristic on Manregian nuts. He also indicated that there
could be many offtypes in the early plantings of Manregians, but the later plantings were much more uniform.

On Friday, August 3, I spent the day with Wayne Roberts. We first visited the orchard at Wheatland Ferry, which was planted by Bert Wepster, now deceased, the father of Jan Wepster, who currently has a small filbert and walnut nursery in Sheridan. This orchard is now owned by Evergreen Helicopters. This is a 100-acre orchard of Franquettes and Manregian seedlings. The remaining trees of Franquette are almost entirely on Manregian. The original black walnut trees were planted in 1928. Beginning in 1956, after blackline had killed many of the black rooted trees, the orchard was replanted with Franquette on Manregian rootstock and with Manregian seedlings. A few of the blacks are still left in the block, but these all appear to have blackline. I saw some trees which appeared to be hybrids, and these also had blackline. The Manregian-rooted trees in this orchard seem to have grown at the same rate as blacks and had reached the same size. The black or hybrid-rooted trees which did not appear to be dying yet from blackline seemed to have approximately the same size, vigor, and leaf color as the Manregian rooted trees.

The Manregian seedlings bloom too early in Oregon and do not bear well. The seedlings in this block had almost no nuts due to very wet weather this spring.

The yield on these Franquettes appeared to be good for 1984. Some of the Franquettes had clusters of four or five nuts. In 1982, this block produced about two tons per acre.

Our next stop was at the Jan Wepster orchard in Sheridan, which is southwest of McMinnville, near the coast range. Jan Wepster is in the walnut nursery business on a very small scale. I estimate that he produced 300-500 trees per year. The nursery process takes three years in Oregon due to only moderate growth of the trees in the nursery. I was told that the black or hybrid takes the same length of time and the growth rate is approximately the same as Manregian. The 1984 season was very poor for nurserymen in Oregon. Many of the seeds rotted and did not germinate. The normal nursery practice is to allow the seedlings to grow until August of the second year when they are budded, or until the early spring following the second growing season when they are grafted. Nurseries in Oregon appear to prefer a side graft rather than a whip graft. This technique was used in both Wepster's and Parrott's nurseries. After budding in the fall or side grafting in the early spring, the tree is trained up a stake or other support the third year and will be marketed the spring following the third growing season.

Wayne also took me to Jan Wepster's Franquette orchard, which is planted entirely on Manregian rootstock. This is approximately 25 years old and has an excellent crop with excellent growth. These trees appear to be equal to the expected size, vigor, and crop of trees planted on black or hybrid rootstock.

The next stop was at the Bert Coleman orchard, now also owned by Evergreen Helicopters, which is north of McMinnville in Yamhill
County. In this orchard, a test plot was conducted in the 1970's by Dr. Harry Lagerstedt and Wayne Roberts comparing black and Manregian. A copy of the results of this test is attached. Their observations indicated that both black and Manregian were acceptable rootstocks, with the black producing higher yields early in the life of the tree. Their measurements indicated that the Franquettes actually grew faster on Manregian than on Northern California black. This may also be a reflection of the yields which were better on black than Manregian. Also, none of the orchards I visited in Oregon were irrigated. They rely entirely on natural rainfall.

In this orchard very few of the black walnut rootstock trees were left. The few black-rooted trees which were left grew to be equal in size to the Manregian-rooted trees. The size of trees, vigor, leaf color, and crop appear to be equal with either rootstock, where blackline is not killing the tree. The orchard had a fairly poor crop and a good deal of blight.

The next stop on August 3 was at the Denfield orchard in Washington County, northeast of McMinnville. Both black and Manregian rootstock were planted in this orchard. The original orchard was black walnut-rooted and most all of these trees were dying or dead. This is a poor, old orchard on steep ground, but the owner claims that it was a heavy producer at one time. Again, in this orchard the Manregian trees appear to be very vigorous and good-looking, but the black trees were definitely declining. The sizes of the black- and Manregian-rooted trees were approximately the same, which indicates that early in the life of the trees, before blackline took over, the vigor was probably about equal. These trees were planted about 1952-53, and the owner says the crops were equal on the black or Manregian trees.

We stopped to look at another orchard in Washington County which was all Manregian-rooted. We did not talk to the owner here, but the orchard was very vigorous with very good-looking trees. The tree trunks on these, as on the other Manregians, appeared to be very smooth. There is little difference in trunk size between the rootstock and the top. In fact, in some cases it was very difficult to locate the graft union because the top and the rootstock are so similar.

These orchards in Washington County near Newberg were on deep, windblown clay loams. They had been very nice orchards at one time, but now are mostly abandoned. Wayne Roberts says that Yamhill County now only has about 2,000 tons production, and Yamhill is the leading walnut county in Oregon. Washington County has much less and few other counties have any production. The filbert industry is currently strong in Oregon and attention is being focused on filberts, not walnuts.

I located three nurserymen who grow walnut trees in Oregon; Jan Wepster, Chet Parrot, and Mr. Rogers. Rogers is Chet Parrott's son-in-law. His nursery is located in Dayton, and he sells trees through Parrott's nursery. These addresses are attached to this report.
I was not able to talk to Jan Wepster in person, but I did contact him Friday evening by telephone. He said that his rootstock seed sources are trees grafted from the plant introduction, PI 18256. He indicated that these seeds from the original trees are difficult to get and he has only four trees that he uses for seed sources. He also indicated that some of the Manregian seedlings, such as Adams, W2, and other named or numbered varieties are variable. Mr. Wepster said that he had not found oak root fungus to be a problem.

I visited Mr. Chester Parrott of Newberg, Oregon. He told me that the yields on Manregian were equal to black. He also said that oak root fungus was not a problem. Jan Wepster had also indicated that oak root fungus is not a problem. Mr. Parrott also had a problem with germination in 1984 due to rotting of the seeds. He agreed that grafting was no problem on Manregian.

Mr. Parrott has a very small nursery. He has a total of 3,000 trees and about 700 or 800 grafted trees which will be available in 1985.

In summary, everyone I talked to emphasized the importance of getting seed only from trees of the original Manregian PI 18256 for use as rootstock. Seedlings from the original Manregians seem to be vigorous and uniform, and make good rootstocks for walnuts in Oregon. Second or third generation seedlings are less uniform and are not suitable for rootstock. Both Jan Wepster and Chet Parrott have Manregian trees which they use for seed sources for rootstock. These trees are open-pollinated; however, since the Manregian blooms early in relation to Hartley and Franquette, there is only a slim chance of cross-pollination with these commercial Persian varieties. As a matter of fact, few Hartleys are grown in Oregon; most are Franquettes. So the Manregians are self-pollinated or possibly crossed with Manregian seedlings in the vicinity.

Both of the nurserymen I talked to and the Extension people indicated that these seedlings are uniform and vigor is very good. Germination is usually good, with the exception of wet years like the spring of 1984. Transplanting appears to be no problem. Grafting, likewise, seems to be no problem even though the percent take, which was indicated to me at 75%, seems low as compared to our commercial operations. I think part of the problem here is the type of side graft being used, which does not appear to be as good as whip grafts which are used in California.

The Manregian root appears to be as vigorous as black and nearly as vigorous as hybrid. The union is very smooth and is almost undetectable in some trees. There is even less difference in size between the top and rootstock than one gets with hybrid.

Yields on Manregian-rooted trees are reported to be good. The Jan Wepster orchard in Wheatland Ferry was reported to yield two tons per acre in 1982, which would be exceptional on Franquette. However, my impression is that yields in 1984 are quite low in most orchards because most growers applied only one or two blight sprays. Blight is very severe in almost all of the orchards that
I visited. In orchards where there are black walnut-rooted trees as well as Manregian, the crops seem to be equal.

Wayne Roberts did indicate to me that crown gall can be a problem on the Manregian, as it is on hybrid. My questions about root rot or tolerance to waterlogging remain unanswered. In most cases, the orchards we visited were on gently sloping to steeply sloping land where drainage was good. One exception was the Jan Wepler orchard in Sheridan, which was on riverbottom soil. Even here, however, the ground was not level and drainage appeared to be good. No one I quizzed about root rot has seen any problem, even on black walnut rootstock. I suspect that since no supplemental irrigation is used and the weather is quite often cool with long periods of moderate rain, that water-logging has not been a problem. Regardless of the reason, no one indicated any problem with water-logging or root rot either on black or Manregian. So this is a question which we need to answer under California conditions.

Likewise, the questions of nematode tolerance are unanswered. No one I quizzed about nematodes had ever encountered any problem with them on any rootstock, and so we have no answer to this.

One of the pressing questions about Manregian and Persian rootstocks in general is their intolerance to salinity. This intolerance with hybrids has been well demonstrated on the west side of the San Joaquin Valley. We suspect that the Persians will not be tolerant to saline conditions and in Oregon no one has experienced this condition. Again, everyone I asked about salinity said that under their high rainfall in the Willamette Valley where walnuts are grown, they do not have any saline conditions.

Finally, the very important question of oak root fungus must be answered in California as well. There are strains of oak root fungus present in Oregon. I asked Wayne Roberts, Dr. Bob Stebbins, and both of the nurserymen whether they had ever seen any oak root fungus problem with Manregian. They indicated that they had not. I also asked whether they had any problem on peaches or any of the other tree crops in Oregon. Again, they indicated that oak root fungus was not a problem.

Dr. Stebbins reported that a survey of more than 10,000 walnut trees conducted by OSU Extension Horticultrist C. O. Rollins from 1950 to 1957 showed that oak root fungus (Armillaria mellea) is a very minor cause of loss of walnut trees in Oregon. Therefore, we will need to test Manregians in California with the oak root fungus strains we have here, as it appears the Oregon strains are not virulent enough to bother even peach rootstock.

Manregian appears to work very well for walnut growers in Oregon. Whether it will work for us is still an open question. Manregian appears to be a very good Persian rootstock as compared to Bureka, Franquette, and other seedlings they have tried in Oregon. However, we may be able to find even better Persians from other sources. The only way we will know is to test these various selections under California conditions.
Dr. Gale McGranahan has received 1,000 Manregian seeds from Chet Parrott to use in statewide rootstock trial plantings. These seed will be growing in the nursery in 1985.


GROWTH OF FRANQUETTE ON NO. CALIFORNIA BLACK AND MANREGIAN ROOTSTOCKS

ANNUAL AVERAGE TRUNK DIAMETER (CM) OF 100 TREES - PLANTED 1962

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Bert Coleman orchard - Yamhill County - No blackline in 1973.

Dr. Harry B. Lagerstedt and Wayne Roberts.
WALNUT ROOTSTOCKS IN OREGON

NURSERIES

Parrott's Walnut Nursery
Chester C. Parrott
Rt. 3, Box 137
Newberg, OR 97132
Phone: (503) 538-4480 (Newberg)
(503) 864-2163 (Dayton)

Rogers (Parrott's son-in-law)
Sherwood
(503) 625-7157

Wepster's Nursery (Walnuts & Filberts)
Rt. 1, Box 59
Sheridan, OR 97378
Phone: (503) 843-3437

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(503) 648-8771