

03. Mixed Species vs. Monoculture:

J. F. Kelsey - - - 2024 May - - - Rev 09

The arguments for a black walnut monoculture are rather obvious – highest return. Black walnut monocultural plantings have been demonstrated as a workable approach on hundreds of plantings. One risk is that an invasive comes along and wipes out black walnut, as has happened with chestnut, elm, and ash. We have used several species of trainers, but plan to end up with a black walnut monoculture. We are taking the risk. Farming never has been a sure thing.

There are several good arguments for a mixed species planting. Some species outperform others on various sites. One approach on a complex varied soil site is to plant a dense species mix and let them duke it out. Let each species find its niche. A good hickory is worth more than a stunted black walnut. This mixed approach will be slow, but more accurate than soil test or a soils map.

All reasonable planting plans start out with hundreds of trees per acre and end up at harvest time with fewer than fifty. The majority of the starting trees will have to go, well before harvest. During these younger years, the trees will tell you who is happy with their setting. No great science is necessary, but at thinning time it would be well to know what the market wants and the relative value of timber species.



Mixed forests are nature’s usual way. There must be a synergy advantage between species, even if we don’t understand it.

The scope of this book is growing top veneer quality black walnut. Achieving that goal is clearly possible on sites designated “well suited” or with a site index above 70. Achieving that goal is clearly impossible on sites designated “unsuited” or with a site index below 35. In-between, I don’t know, but it is worth a try with other valuable hardwoods in the mix as backups. The trees will sort things out.

A longtime proponent of dense mixed direct seeding is Larry Krotz from northern Iowa. You can read the story of his experience at: thescalepit.com/ContentBW/MLF.htm

Comment from Jerry Van Sambeek:

A few thoughts for additions that do not need science to back them up. The forest you picture is a mix of mature overstory trees with an understory of shade tolerant shrubs and unhappy suppressed trees. It is reasonable to assume we can create a mixed species planting of shade-tolerant shrubs under our monoculture of walnut that will have little impact on walnut growth while suppressing the growth of ferns and invasive grasses. If these shrubs have the potential to fix nitrogen all the better – problem is we don’t have any natives I am aware of that do a good job of this. Ken Kessler found shrubs that defoliate in the fall after the walnut tend to cover the walnut leaves and accelerate their decomposition or encourage soil organisms to feed on the leaves. You’ll have mixed reaction to encouraging earthworms but they can quickly reduce leaf litter. Ken has a list of other organisms we don’t think about like springtails. This reduces the number of viable fungal infections that can produce spores in the spring to reinvest the walnut. One of your invasive shrub species is quite effective because initial growth rates are similar to walnut and can provide adequate side shade to limit branch growth. Not sure we can suggest an alternative -- how about hazelnuts or are they considered non-native or shade-intolerant? The bush honeysuckles are not an alternative based on actual mixed plantings. Hopefully there is some food for thought on how to expand on the option for mixed plantings without significant growth reductions that resemble native hardwood forests.

Author’s reply:

I planted a long row of European hazels (*Corylus avellana*) and some ended up under the drip line of black walnuts. None of the hazels near the walnuts survived. The rest of the row are okay. I assume the problem is sensitivity to juglone produced by the black walnuts. I suspect American hazels (*Corylus americana*) would have no such problem, based on my unproven theory of co-evolution, i.e., overlapping native ranges, but *C. americana* is slow growing and a much smaller bush than *C. avellana*.