

## Mango Taxa for Wet Areas<sup>®</sup>

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We have a small mango nursery in marginal mango-bearing country. Some years we could be classified as the dry tropics, other years, like this one, we could be considered the wet tropics. For this reason there are no commercial mango farms in the district. For those of you fortunate enough not to be addicted to the "king of fruits", you need to know that commercial cultivars of *Mangifera indica* require very dry weather for successful flowering and fruit set. Some years this requirement causes headaches for us as nurserymen.

The source of the rootstocks used for our grafted mango trees were the semi-wild mangoes growing round the district. We'd go and fight the inebriated parrots and the mango chutney makers for the fallen fruit, clean them up, open the seed, and extract and plant the kernel.

Our land holding is quite small and rather than grow seed we used all available space for budwood trees and thought that this arrangement was pretty clever. Then about 4 to 5 years ago the weather began to change. We started to get wet weather in July and August, right when the common mangoes are in flower. Consequently there was a greatly reduced crop or no crop at all. I had just given up my seasonal employment about then, and we were relying more on the nursery than ever. Two things came out of this dilemma — I had to start driving a 240-km round trip twice a week to pick up mangoes from a dryer area, and we bought the 2-acre block next door to set up an orchard devoted to growing mangoes purely for rootstocks.

But the problem was still the reluctance of *M. indica* cultivars to reliably produce fruit in wet years. I can't remember how it happened, but I discovered there were about 70 different species in the genus *Mangifera*, and that some of them bear fruit in even wet conditions.

That's when it all started, the search for *Mangifera* species already imported into Australia. The research, the phone calls, requests for copies of seminar papers, locating and buying the few available books on the mango species. There was a wealth of information on how to grow *M. indica*, but not a lot on the other species.

What finally gave us clear information was the purchase of Kostermans and Bompard's book *Mangoes: Their Botany, Nomenclature, Horticulture and Utilisation*. I am eternally grateful to Dr. Vinod Kulkarni for recommending this book, because as well as colour plates and botanical text, it has the vernacular names used in different countries.

We were then able to ask people that we knew who had been to Southeast Asia in search of other tropical fruits, such as mangosteen, rambutan, and durian, if they had imported any mango seeds as well. A surprising number had, usually buying fruit in the village markets in wet areas, and even though it often didn't taste that good, they brought them back just in case they might give a few fruit at home. Others were collected because they were outstanding selections of their respective species.

Most are known here by their vernacular name, with the exception of those imported by Alan Carle. So it began, collecting seedlings and harvesting budwood from established trees. As most *Mangifera* species grow into large trees, we decided

to graft all of them onto our selected common rootstocks. This would hopefully keep them smaller, make them fruit earlier and speed up propagation and collection time, rather than waiting for seedlings to bear. The budwood we grafted immediately and the seedlings we grew on until they were big enough to yield scion wood.

There are more than 14 species in our collection and all but two are graft compatible with *M. indica*. This includes species from; Bali, Kalimantan, Sabah, Sarawak, Thailand, and North Vietnam. We have had to try to identify most of these species by the use of their vernacular names. I know it's not very scientific, and we have probably made some mistakes. We won't be 100% sure of each species identity until they flower and fruit.

Kostermans and Bompard (1993) divide the genus into 6 sections or subgenera. We have species from four of these sections. Species from three of these are graft compatible with *M. indica*. They are as follows :

Subgenera <i>Euantherae</i>	Subgenera <i>Mangifera</i>	Subgenera <i>Limus</i>
<i>M. caloneura</i>	<i>M. altissima</i>	<i>M. foetida</i>
<i>M. pentandra</i>	<i>M. applanata</i>	<i>M. leschenaultii</i>
	<i>M. casturi</i>	<i>M. odorata</i>
	<i>M. laurina</i>	
	<i>M. quadrifida</i>	
	<i>M. rubropetala</i>	
	<i>M. torquenda</i>	

We also have a seedling *M. caesia* from the subgenus *Limus*, and a marcot of *M. griffithii* from the subgenus *Rawa*. Budwood from both *M. caesia* and *M. griffithii* failed to take when grafted onto *M. indica*. Hopefully this small collection of mango species will one day give us a wet-weather rootstock.

Most of the *Mangifera* species are not renowned for their palatable fruit. A lot of them are used at the green immature stage, in pickles or spicy salads. We hope that by the introduction of modern horticultural practices such as controlled and regular fertiliser and watering programs, the taste and size of some of them will improve.

As well as the use of other species as rootstocks being trialed for *M. indica* cultivars, there also needs to be a cross-species breeding program. The aim should be to improve disease resistance. This could hopefully reduce the need for chemical spraying.

Some of the species we have collected are further subdivided into varieties, as the original collectors selected fruit because of various superior qualities. While this fruit was purchased in village markets, thus making its origins unclear, it is probable the fruit came from large isolated trees. It is also probable that we will be able to graft mature wood from these selections onto different rootstocks in the future, keeping them smaller and making them more productive than in their native state.

These improved trees could one day find their way back to devastated environments such as East Timor, or be incorporated in agroforestry or land reclamation projects. Commercial or semicommercial orchards of these species or varieties could

perhaps be established where markets exist for these fruit. There is also the potential with cross species breeding for the development of completely new fruits.

The rest of the orchard is mainly *M. indica* cultivars that we will use for rootstocks. One of these is particularly interesting. The recent summer and autumn have been particularly cool with unusually high rainfall and long periods of windy overcast weather. The temperatures have been up to 10°C below average. This is our growing and grafting season, and mangoes like it hot for maximum growth rate and high grafting success rates. All our seedlings were slow to get away this year with the exception of one particular line. The shape of its leaves is the same as other commons, as is the smell of the crushed leaves. However the growth of the trunk diameter is much faster than other seedlings of similar height. This fast-growing type could prove to be a good rootstock for tropical and subtropical areas, with the weather being possibly more uncertain in the future.

We also have two *M. indica* cultivars that have possibilities as dwarfing rootstocks. One is a Thai selection with short internodes. The other is an Indian monoembryonic selection also with short internodes. Cuttings are taken and when struck, grafted with the desired scion. These rootstocks could be useful where large tree size makes management difficult, or in high-density planting situations.

As well as the aforementioned Alan Carle and Vinod Kulkarni, I would also like to acknowledge the help of the following people for assisting in putting this collection together; Len Muller, Laurie Smith, Andre Leu, David Chandlee, Kerri McEvoy, Ian Bally, Don McLeod, and Ken Rayner.

The survival of wild mango species is under constant threat due to the pressures of land clearing for farms and logging. Some of the species may be extinct before they have even been collected. I hope our small collection of the more common and easily collected Mangoes will contribute to the diversity of genetic material available for future research and breeding programs.

#### LITERATURE CITED

**Kostermans, A.J.G.H.** and **J.M. Bompard.** 1993. Mangoes: Their botany, nomenclature, horticulture and utilisation. Academic Press, London.