# WELCOME TO THE NEW URBAN JUNGLE

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With the ever-increasing concerns over climate change, a new design approach to urban landscaping is needed to meet the challenge. Increasing the volumes of biomass, and so shade, is how we can achieve this, but what will it look like? We need to create urban forests on our streets and a traditional form of management can be adapted to form these new urban treescapes, called coppicing.

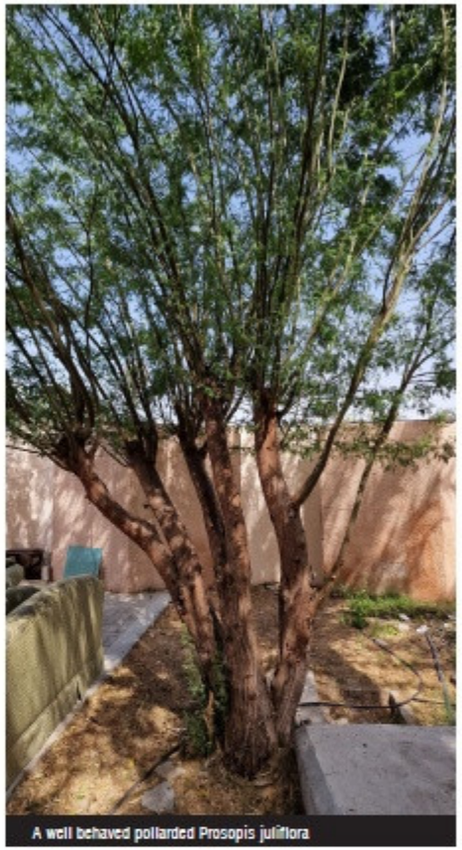
Coppice is not a term much used in the Middle East, being a practice of woodland management from more temperate regions. What does this mean and why might it be relevant to modern urban landscape design and management?

According to Wikipedia: Coppicing is a traditional method of woodland management which exploits the capacity of many species of trees to put out new shoots from their stump or roots if cut down. In a coppiced wood, which is called a copse, young tree stems are repeatedly cut down to near ground level, resulting in a stool.

In my last article (September issue) I spoke about the need to create micro-ecosystems in our planting design, not just ornamental arrangements, which will never create sufficient microclimate cooling or phytobiome generation. Coppicing, as a form of landscape management, is one way in which we can achieve this using woody trees and shrubs and cutting them to form a stool, on a regular cycle to promote regrowth. It is an easy maintenance procedure, provided the context and reasoning is understood. It should be done selectively, rather than an all at once basis, so the treescape is never removed entirely.

We can generate healthy soils this way, using the arisings from the coppice to make woodchips, which are returned straight onto the soil as mulch. We can also make biochar, which when activated and mixed into the soil makes for long-term carbon and water storage, along with missing micropore space (as sandy soil particles only provide macropores) which form the required structure for nutrient capture (cation exchange), bacteria and fungi.

Ghaf showing regrowth after being topped



A well behaved pollarded Prosopis juliflora

Many species from around the world have been introduced as part of agroforestry systems. Some have become what's often considered invasive, which is really a matter of (mis)understanding a pioneer species taking advantage of new, usually disturbed and degraded available ground. Two trees which are notorious in this regard are Prosopis juliflora and Leucaena leucocephala, yet they are both useful and beautiful, providing fodder, nitrogen fixation, are good for wildlife and require little or no irrigation. I would suggest that coppicing is the ideal management methodology for such species.

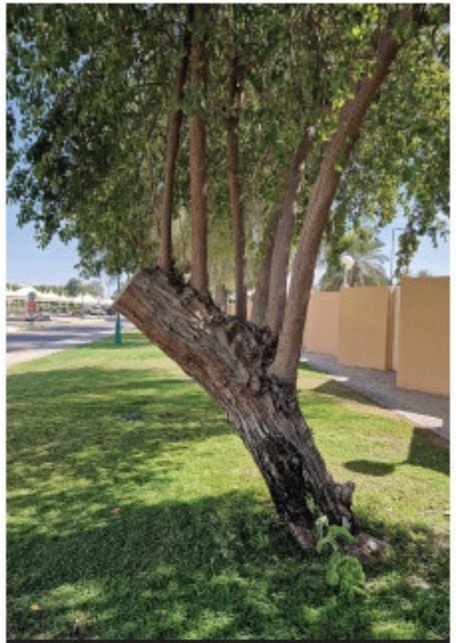
That's all very well for farms and forestry, but how does this relate to our urban landscapes, where the demands are very different, and beauty is the traditional main aim? It turns out that a surprising number of ornamental trees and shrubs can be managed in this way. Basically, anything which produces a strong epicormic regrowth response will coppice, though some are more suited than others over the long-term. It is useful to divide the list of useable trees into nitrogen fixing and non-nitrogen fixing; this is to ensure we mix the plants together in our planting designs so all benefit from naturally available Nitrogen.

Pruned Vitex, showing coppice potential

Some Nitrogen fixers:
*Acacia saligna*
*Albizia lebbeck*
*Leucaena leucocephala*
*Pithocellobium dulce*
*Prosopis cineraria*
*Prosopis juliflora*
*Senegalia (Acacia) senegal*
*Sesbania sesban*
*Vachellia (Acacia) nilotica*
*Vachellia (Acacia) tortilis*

Some non-Nitrogen fixers:
*Azadirachta indica*
*Conocarpus lancifolius*
*Eucalyptus camaldulensis*
*Ficus benghalensis*
*Millingtonia hortensis*
*Moringa oleifera*
*Tamarix aphylla*
*Tecoma stans*
*Vitex agnus-castus*
*Ziziphus spina-christi*

Basal regrowth of Vechellia farnesiana



A previously lopped Sidr has regrown as a pollard

Extra-large thorns on epicormic shoots, Vachellia nilotica

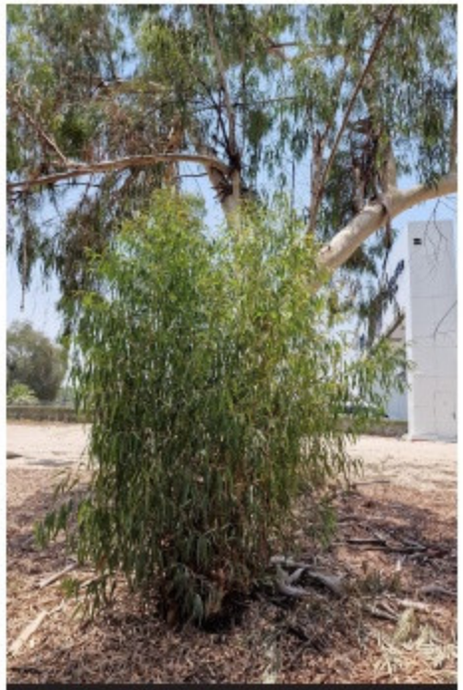
There will be many more suitable plants than this short list, including smaller shrubs, most will need a bit of trial-and-error experimentation to gauge response and coppice intervals.

One of the problems with some of these species are the thorns they produce, which can be especially large on epicormic regrowth. In some urban planting this may be a problem and positioning of these species is something to consider. In this respect, some Australian Acacia are thornless and might be used to replace more regional ones (Vachellia and Senegalia).

The design aims of this are multiple; we have all the usual requirements to produce planting of high amenity value, plus we are layering in ecological factors such as soil ecology and environmental health (think evapotranspiration and heat mitigation) via the production of biomass. We design around the principles of layering our plants (horizontally) plus management aims for the vertical extension (height) of the planting. Palms can be scattered through as a permanent overstory.

Basal growth on Tamarix aphylla

Neem tree, growing on a brownfield site



Eucalyptus, with basal growth showing coppice potential

One of the positives of this system is that we don't worry about 'ultimate heights' of species as this is controlled by the coppicing cycle, trees never get too large for the space that holds them. From a maintenance point of view, the skill set needed is not far from what is currently available; we don't need trained arborists to climb trees, we just need skilled ground workers who know how, when and why they coppice the plants. A little training would turn most maintenance teams into competent urban foresters.

In urban streets, ribbon planting design can produce high biomass/m² in a minimum of two-metre-wide borders, running along pavements of sufficient width. Continuous soil volume is important in achieving good soil microbial activity – individual tree pits should have subterranean connection of soil medium, and preferably just be removed and incorporated into open ribbon design. I am a strong believer that building soil ecology works with the existing soil, no matter what the conditions. This can be healthier long-term than importing sweet soil, provided this factor is considered in the planting design and species selection, salinity is a big factor to consider.

To build soil ecology, the arisings from coppicing are turned into ramial chipped wood (RCW - shredded branches of less than 7cm diameter) which are then mulched straight back onto the planting areas, feeding the soil ecosystem. These landscape systems can be self-supporting, with no external inputs (a lot of mulch currently used is imported). No fertilizer is required either, that the job of the soil bacteria and fungi; we feed the soil microbes with RCW and they feed the plants. In this maintenance regime, hedge trimmers are not required! The misuse of these machines has ruined too many landscapes, destroying plant individuality and form.

Let's be clear of the advantages to adopting this design AND maintenance approach to our landscapes:

- *High amenity look and value, multiple species/space occupancy/biomass/shade.*
- *Ramial Chipped Wood creates an enlivened soil micro-biology, supporting plant health and resilience.*
- *Opening up the canopy of planting with selective coppicing changes light levels and invigorates new growth, plant and insect populations. Change brings life.*
- *Better soil micro-pore structure requires less irrigation.*
- *High growth response rates, good for sequestration and evapotranspiration.*
- *Easy maintenance regime (different but no harder, no butchered trees).*
- *Little or no need for external inputs into site. Climate resilience with correct plant selection. Reduction of Urban Heat Island effect – cooler streets and pavements.*
- *SUDS (sustainable Urban Drainage Systems) can be designed into the planting to absorb rainwater (which tends to be all or nothing).*

This approach needs trialling on a commercial scale (also for private gardens) and would be an easy adaptation in some areas, especially some parks like Al Ittihad on the Palm, Dubai. There are caveats, of course, some species will respond well if coppiced young, but not tolerate this if started when more mature as they may no longer have the vigour or the latent adventitious buds to respond well. Nonetheless, the advantages are many and this should be tried.

For new landscapes, we plant young trees, no more than 3-5cm diameter. They will establish and grow much faster than larger trees and be ready to coppice sooner. If this became established, nurseries could produce coppiced trees ready for planting which would give the often-required instant impact. We also can avoid all the bad tree staking that is so often seen!

With climate and carbon sequestration as the major challenges, it's time to seriously upgrade and intensify our urban landscapes – the rewards will give new meaning to the urban jungle! ■

Millingtonia has a dense suckering habit, ideal for coppice

Mark Laurence Bio

*Mark Laurence is a consulting arborist (ISA certified), horticulturalist (MCIHort) and landscape designer (MSGD), with over forty years' experience. He has a special interest and love of working with trees and adaptive landscapes in the Middle-East, principally in the United Arab Emirates.*

*Since 2010, work has included surveys on trees being lifted for replanting for the redevelopment of a park in Abu Dhabi, surveys and training of staff in the grounds of a number of royal palaces in Abu Dhabi and Dubai and tree consultation on historic and commercial sites.*

*The current focus is on integrating climate mitigating, functional ecosystems into urban planting to deliver ecosystem services and produce-giving, low water input planting systems.*

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