Vyfde uitgawe
2024

Koeda

Pretoria Bonsai Kai

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In hierdie uitgawe

The word Koeda is Japanese and means: 'Graceful branch'. It is pronounced Ko-eda.

Van die redakteur

Bome is vir my een van die wonders op aarde. Hulle is onmisbaar vir die bestaan van die aarde deurdat hulle suurstof verskaf, koolstof dioksied opneem en hulle verskaf kos en blyplek vir miljoene diere. Daar word gereken dat daar tans sowat 3.04 triljoen bome op aarde is. Sowat 422 vir elke mens op aarde. Die hartseer is dat daar sowat 12000 jaar gelede meer as dubbel soveel bome op aarde was. As die vermindering van bome teen dieselfde tempo plaasvind as oor die afgelope 12000 jaar is die aarde in die moeilikheid.

Die hoeveelheid spesies bome wat op aarde voorkom is ook asemrowend. Daar is sowat 73300 spesies bome op aarde. Daar word gereken dat in die Amasone woude alleen daar sowat 16000 spesies is. In Suid-Afrika is daar sowat 1600 spesies.

Gelukkig is daar lande, soos China, Etiopië en selfs "United Arab Emirates" wat groot projekte het om bome op geweldige groot skaal aan te plant. In 2019 is sowat 7 biljoen bome oor die aarde aangeplant. Indien dit volgehou kan word kan die bome op aarde dalk stabiliseer.

Dit gee my hoop. En alhoewel ek dit seker nie in my leeftyd sal ervaar nie kan ons nageslagte daarby baat.

As elkeen sy deel doen deur bewus te raak van die geweldige ontbossing wat in sekere dele op aarde gedoen word en dan poog om byvoorbeeld nie papier te mors of onnodig te gebruik nie is daar dalk hoop.

Elke keer as jy aan een van jou bonsai boompies werk, onthou wat se wonder bome op aarde is.

Groete

Jaco

"Bonsai is not the result: that comes after. Your enjoyment is what counts." John Naka

Baobabs 2024

Na aanleiding van die artikel in die vorige uitgawe waarin Ian Pingle vertel het van sy Kremetarte, het Ian die volgende artikel aangestuur:

Baobabs: Africa's unique trees defy climate challenges, continue to flourish

Published: August 25, 2024. 8.45am SAST

Author: Sarah Venter

Baobab Ecologist, University of the Witwatersrand

Disclosure statement

Sarah Venter is the Director of The Baobab Foundation.

Partners

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Baobabs 2024

Sagole baobab is the largest baobab tree in the world. Sarah Venter.

Baobabs reach extraordinarily old ages. Some have been found to be thousands of years old. During these life spans, elder baobabs have survived erratic climate conditions.

As an ecologist who has spent the last 17 years studying baobab, I decided to look specifically at the health of adult baobabs in Southern Africa and then in Africa as a whole, to establish if more recent human-induced climate change has started having an effect on these magnificent trees.

Over the course of 2023 I travelled across Botswana, South Africa, Namibia, and Zimbabwe visiting baobabs located in the area as well as 13 other particularly old and large specimens, including Sagole (named after a local hot spring), the largest baobab in the world.

As I travelled, I became increasingly impressed by baobabs' fortitude. Not only is the cohort of southern Africa's oldest and largest baobabs enduring, but most baobab populations in Africa are healthy and stable, with low mortality rates. Indeed, nothing I saw supported the notion that Africa's baobabs are dying because of climate change.

Our mission is to share knowledge and inform decisions.

This is important because baobabs have been a source of food, fibre, and medicine for centuries. Over 300 uses of baobabs have been described (See below *The Importance of Baobab (Adansonia digitata L.) in Rural West African Subsistence—Suggestion of a Cautionary Approach to International Market Export of Baobab Fruits by Christine Buchmann, Sarah Prehsler, Anna Hartl & Christian R. Vogl*

In the last decade, the growing trade in baobab fruit products has supported thousands of rural communities, especially marginalised women who are able to collect fruit from the trees around their homesteads and sell it for much needed income. The possible demise of baobabs would have devastating consequences for many people and local economies.

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Climate change is not new for millennial trees.

Baobabs are originally from Africa, where they occur in 32 countries.

It is well-known that baobabs reach extraordinary old ages. Radio-carbon dating has repeatedly found baobabs well over 1,000 years old, with the oldest among them reaching 2,500 years in age. Over their life spans baobabs have survived erratic climate conditions including droughts and floods. Researchers used carbon isotopes recovered from the pith of nine baobabs to recreate rainfall patterns for the last 1,000 years. These records show that the southern part of Africa experienced numerous successive droughts, one of which was even severe enough to cause the abandonment of the Mapungubwe capital, a significant archaeological settlement, in the early 14th century.

My observations on the general good health of baobabs do not stand alone. Several surveys across many parts of Africa also show stable baobab populations. It is estimated that there are up to four million baobab trees in Zimbabwe alone, and this only represents a fraction of Africa's population.

Adult tree mortality is negligible, except for where elephants are found. Elephants rely on eating baobab bark in the dry season, and when elephant numbers get too high, baobab trees become over utilised, which can lead to population decline. However, where there are no elephants, adult baobab trees have a high survival rate.

Baobabs are not immortal, so what are the threats?

There are of course several threats to baobabs – the most devastating of which is herbivory (the act of eating plants). Studies across Africa have shown that young trees are under high browsing pressures from domestic animals and wildlife. While browsing is not as much of a threat to adult baobabs, elephants are.

These animals were responsible for the dramatic decline and almost extinction of baobabs in Tsavo East National Park (Kenya) in the 1970s. They were responsible for a mortality rate of 8% in Mapungubwe National Park (South Africa) between 2009 and 2019.

This rapid loss of adult trees is doubly alarming as baobabs rely on a storage effect for episodic recruitment (meaning that the long-lived nature of the tree allows them to keep producing seed for hundreds of years). Without adult trees, these areas will not easily be populated again.

While major drought events of the mid 1960s and early 1970s, 1980s, and 1990s certainly caused the death of several baobabs in the region, too much water appears to be more of a threat to baobabs than too little.

Baobabs are vulnerable to too much water in the dry season (winter) when leafless, as leaves function as a pump for water that comes from the roots. Without leaves, baobabs have no way of getting rid of excess water and develop root and stem rot, leading to collapse or death.

This may be why baobabs in high rainfall areas do not achieve the same longevity as those in drier areas. It is also interesting to note that only one baobab named in previous studies which described the collapse and death of a number of large baobabs in southern Africa died during a drought period while two collapsed from too much water due to artificial watering over multiple winter seasons.

Baobabs 2024

Symbols of resilience

As global temperatures continue to rise, millions of life-forms around the globe are under threat.

Plants and animals differ in their ability to cope with variable climate conditions. Many are sensitive to the slightest change and thus may be the first to die.

In contrast, baobabs are well adapted to changes in temperature and rainfall, as can be seen by their wide geographic distribution and extreme longevity. Baobabs, like any life-form, are mortal, but they may well be the "last tree standing." Far from victims of climate change, as punted by social media, they can be symbols of resilience.

The Importance of Baobab (*Adansonia digitata* L.) in Rural West African Subsistence—Suggestion of a Cautionary Approach to International Market Export of Baobab Fruits

Christine Buchmann, Sarah Prehsler, Anna Hartl & Christian R. Vogl. Pages 145-172 | Published online: 13 May 2010

Abstract

The European Commission recently authorized the import of baobab (Adansonia digitata L.) fruit pulp as a novel food. In rural West Africa, the multipurpose baobab is used extensively for subsistence. Three hundred traditional uses of the baobab were documented in Benin, Mali, and Senegal across 11 ethnic groups and 4 agroecological zones. Baobab fruits and leaves are consumed throughout the year. The export of baobab fruits could negatively influence livelihoods, including reduced nutritional intake, change of power relations, and access rights. Capacity building and certification could encourage a sustainable and ethical trade of baobab fruits without neglecting baobab use in subsistence.

RESULTS

In total, 300 different uses were recorded during the field research and sorted into use groups: medicinal, nutritional, spiritual, ethnoveterinary, and other uses. The differentiation between the uses is based on variations in preparation (e.g., cold extraction, boiling, fermentation), application (e.g., external, internal) and product form (liquid, paste, powder). When related to medicinal uses the differentiation is also based on the illness or symptoms that need to be treated (e.g., malaria, fever, fractures). The resulting overview shows that the medicine-use group contains the greatest variety with 179 different uses. In comparison with the wide variety of medicinal uses, the 34 documented nutritional uses seem few. Although only 24 spiritual uses were documented, the number of applications for spiritual uses can be assumed to be much higher in reality, as it proves difficult for those outside the community to collect such privileged information. There were 47 "other uses" documented, including uses such as construction (baobab wood used as formwork for cement), firewood, rope-making (used to attach livestock, or water buckets at wells), fertilizer, soap making, and many others which were not mentioned frequently. Sixteen ethnoveterinary uses were reported. This is the only use category that shows statistical significance ($p = .001$, using a chi-square test) between the sexes, explained by the fact that it is usually men that are herders. One-third of informants stated that the baobab is their "most important" tree in comparison with other useful trees found in the local ecosystems. In order to understand

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the prominent position of the baobab, direct questions were asked on the reasons for that choice. The reason "multiple uses" applies when informants stated that they value the range of uses that can be applied from just one tree species. The Kruskal-Wallis test indicates significant differences between the uses ($p = .000$). The Mann-Whitney test shows that the use as nutrition is cited significantly more often than the other uses ($p = .000$ for each) and that the use as medicine is listed more often than multiple uses, commerce, and tradition ($p = .000$ for each). There is no difference between these last three uses.

Chloroplast DNA phylogeography suggests a West African centre of origin for the baobab, Adansonia digitata L. (Bombacoideae, Malvaceae)

Jean-Michel Leong Pock Tsy[1], Roselyne Lumaret, Diana Mayne, Abdallahi Ould Mohamed Vall, Yahia I M Abutaba, Maurice Sagna, Soaharin'ny Ony Rakotondralambo Raoseta, Pascal Danthu

Abstract

The African baobab (Adansonia digitata L.) is an emblematic, culturally important, and physically huge tropical tree species whose natural geographical distribution comprises most of tropical Africa, but also small patches of southern Arabia, and several Atlantic and Indian Ocean islands surrounding the African continent, notably including Madagascar. We analysed the polymerase chain reaction-restriction fragment length polymorphism of five chloroplast DNA fragments obtained from 344 individuals of A. digitata collected from 74 populations covering the entire extant distribution range of the species. Our goal was to reconstruct the phylogeographical history of the species and, if possible, to identify its centre of origin, which has been a subject of controversy for many decades. We identified five haplotypes whose distribution is clearly geographically structured. Using several species of Adansonia and of closely related genera as outgroups, the haplotypes showed a clear phylogeographical pattern of three groups. Two are phylogenetically related to the outgroup taxa and are distributed in West Africa. The third group is substantially more differentiated genetically from outgroup species, and it corresponds to southern and eastern Africa, Arabia, and the Indian Ocean islands, including Madagascar. According to our results, the tetraploid A. digitata, or its diploid progenitor, probably originated in West Africa and migrated subsequently throughout the tropical parts of that continent, and beyond, by natural and human-mediated terrestrial and overseas dispersal. ♣

Vergadering van 7 September 2024 - mini uitstalling








Vergadering van 7 September 2024

Juan Duvenhage, links, van Bloemfontein Bonsai Kai het vir ons kom kuier. En was dit nie ’n ondervinding om sy fantastiese skeppings te kon sien en hoe hy dit maak nie. Onder, en op die volgende bladsy, is twee voorbeelde wat Juan gewys het, met “close up” foto’s van die ongelooflike detail wat Juan doen.

Bo: Die toneel met ’n skildery agter wat hom afrond, is van ’n plaashuisie in die Oos Kaap. Die mure is van blouklip wat Juan met ’n hamer in klein stukkies slaan en dan een vir een plak. Regs bo kan gesien word hoe die toneel voor die skildery slaan.

Op die twee foto’s, en die twee op die volgende bladsy, kan die geweldige detail gesien word. Let op die geplaveide stoep, ’n maalklip waterbak, die sinkplate op die dak en die dakbalke.

Vergadering van 7 September 2024

 

Onder is die tweede voorbeeld wat Juan gewys het met van dieselfde geweldige detail wat hy doen.

 

 

Vergadering van 7 September 2024

Juan het gedurende die vergadering ’n vuurtoring landskap gemaak. Hy het die basis, wat die rots voorstel, reeds by die huis gemaak. Hy het dit met ’n mengsel van 50:50 sement en papier gemaak, wat hy dan op ’n basis gesit het.

Die vuurtoring het Juan ook by die huis gemaak. Elke steentjie word apart gesny en dan met skuurpapaier afgewerk. Juan plak die steentjies een een en gebruik hoofsaaklik die epoxy produk met die naam STEENVAS. Die huisie wat langs die vuurtoring gekom het was gedeeltelik klaar. Juan het gewys hoe hy die steentjies plak. Hy gebruik verskillende groottes sowel as verskillende kleure om dit interessant te laat lyk. Hy werk die groewe tussen die steentjies af met ’n sosatie stokkie.

Die detail is net asemrowend en om dit te beskryf doen onreg aan die skepping. Kyk gerus na die foto’s wat geplaas word en let op die detail.

Vergadering van 7 September 2024

Die dakteeltjies is die enigste item wat Juan nie self gemaak het nie maar aangekoop het.



Die komponente word bymekaar geplaas.



Laastens word ’n boom ook geplaas wat die skepping afrond!!

Terugvoering oor demonstrasie / werkswinkel bome.

Die vergadering van 6 April 2019 het die bespreking van ongestyleerde bome, wat deur lede gevat is, behels. Onder is 'n foto van een van die bome, 'n Kanniedood van Jaco, wat bespreek is. Oorlede Louis vd Walt het raad gegee dat die boom DRASTIES teruggesnoei moes word. Onder links is die boom by die vergadering en in die middel hoe Jaco hom teruggesnoei het net na die vergadering. Die foto's was in Koeda uitgawe 2 van 2019 geplaas.



Die vergadering van 10 April 2021 was dieselfde tema, dus dat ongestyleerde bome bespreek is. Jaco het dieselfde boom geneem vir bespreking. Die foto bo regs wys hoe die boom weer uitgegroei het. Gedurende die vergadering is die takke weer hard teruggesnoei, foto onder links. Die twee 'stompies' in die groei bak is takke wat gegroei het met die vorige snoei wat sommer so in die grond gedruk is. Die foto's was geplaas in Koeda uitgawe drie van 2021.

Oor die volgende drie jaar, soos die groei plaasgevind het, is daar meer fynsnoei toegepas. Die boom is toe in Augustus 2024, dus net meer as vyf jaar na die eerste werk aan die boom gedoen is, in 'n bonsai bak geplant. Die foto regs onder wys die boom soos op 29 Oktober 2024 afgeneem. Drastiese werk is dikwels nodig om by 'n redelike finale skepping te kom. Nou vir fyngroei ontwikkeling.


Vergadering van 5 Oktober 2024

Ons het by Org se huis bymekaar gekom. Daar was aan 'n paar bome van lede gewerk, of raad gegee, waarna Org aan 'n groot (wat anders) Olien gewerk het. Daarna is heerlik gekuier en vleis gebraai. Dankie aan Org vir 'n lekker dag en veral die heerlike pap en sous wat hy gemaak het.

Bo: Org het hierdie Natal vy tussen al die ander plante op sy erf "ontdek", wat hy 'n paar jaar gelede op 'n rots geplant het. Die boom is in 'n bonsai bak geplant, waarvan daar ongelukkig nie 'n foto geneem is na die oorplant nie.

Bo: Vorster voel dat hierdie pragtige Kremetart se onderste takke dalk bietjie laer moet wees, om die gevoel van ouderdom te gee.

Onder: Tristan het raad gevra oor hierdie Akasia, en toe sommer daad by die raad gevoeg.

Vergadering van 5 Oktober 2024

Hierdie “Previt” van Erika is bespreek. Erika sal bietjie gaan dink aan die opsies wat genoem is voordat sy ’n besluit neem.

Onder: Org het hierdie Olien by Rustenburg uitgegrawe so 8 jaar gelede,. Hy het die boom teruggesnoei na net drie takke en gaan ’n Literati styl maak. Sal goed wees om te sien hoe die boom ontwikkel.

Snippets

Our Environment.

Choose rechargeable batteries, then recycle them when they die.

You'd have to use hundreds of single-use batteries to equal the energy you'd get out of one rechargeable battery.

Be sure to recycle all batteries to keep harmful metals from entering the environment.

Inspirasie uit die natuur

Dit is nie bekend wat se soort boom hierdie is nie en ook nie waar die boom afgeneem is nie.

So 'n alleenstaande boom is altyd 'n goeie aanduiding hoe 'n boom in die natuur groei indien daar nie ander faktore is wat hom beinvloed nie. Die vorm van die boom is baie natuurlik. Is hierdie 'n vorm wat as bonsai nageboots kan word?

What are soils—bonsai soils.

By Michael Kidson - Michael has offered to write a series on soil as a supplement to the presentation that Louis gave. This is the third of the series.

Soils: An introduction

Soil fertility

Introduction

We strive for a balanced diet imitating the dietary triangle, to balance the nutrition uptake and not overindulge with potentially harmful components such as animal fats. Similarly, the plant also has requirements for varying quantities of nutrients.

Figure 1. A breakdown of the main food groups - For illustrative purpose only.

What are soils—bonsai soils.

A Brief history

Since man has settled and started growing crops, there has been an interest in the soil and the plant nutrition. The mystery of the change of an apparently lifeless seed to a vigorous growing plant never loses its freshness and constitutes no small part of the charm of bonsai’s.

In the Roman times there was extensive literature on agriculture which maintained a pre-eminent position until recently. The Roman literature was condensed in 1240 by a senator of Bologna, Petrus Crescentus whose book was one of the popular treatises on agriculture of all time. There were further books published with ingenious speculations that have been justified by later work. Example Palissy’s remarkable statement in 1563:

“You will admit that when you bring dung into the field it is to return to the soil something that has been taken away…….. When a plant is burnt it is reduced to a salty ash called alcaly by apothecaries and philosophers…….. Every sort of plant without exception contains some kind of salt” (Russell, 1977).

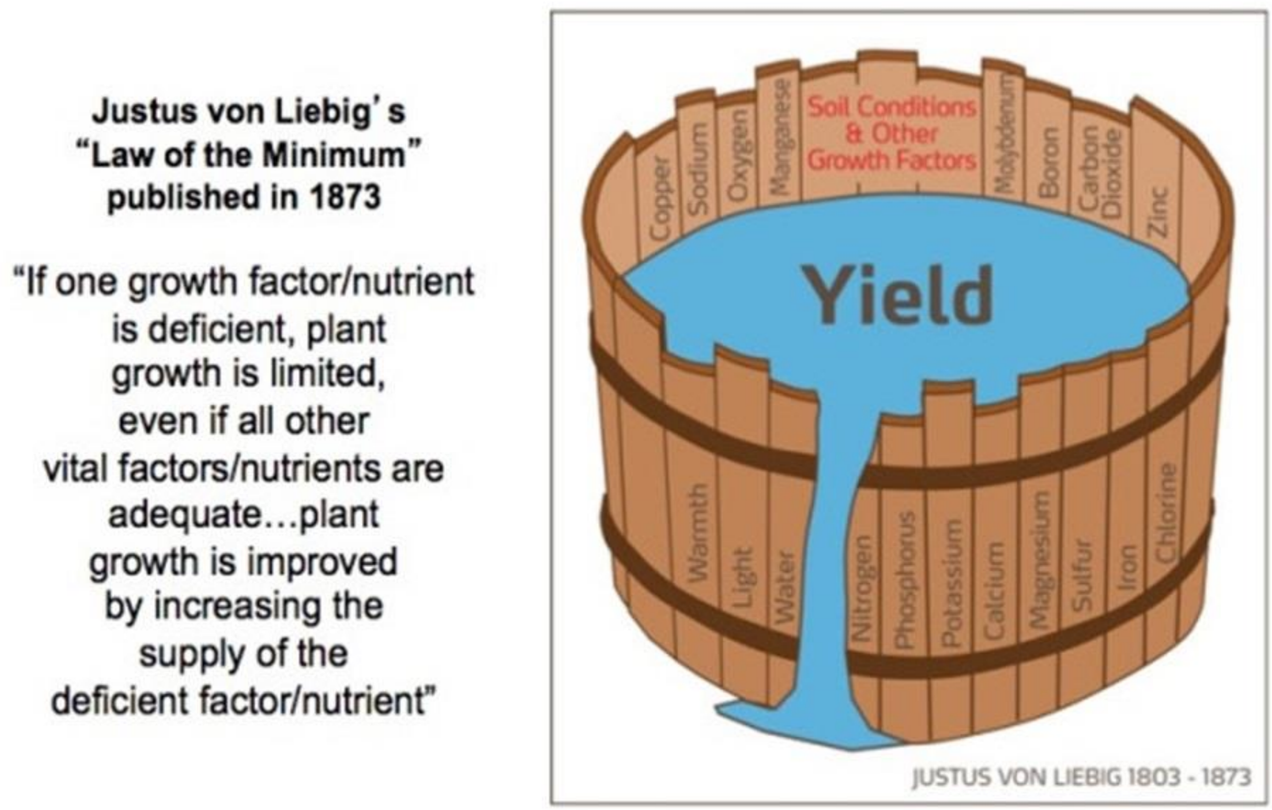

Figure 2. A variable length slated barrel representing Liebig’s “law of minimum” (https://earthwiseagriculture.net/grower-s-toolbox/law-of-minimums/)

In Figure 2, a barrel of varying slate lengths is illustrated. The maximum amount of water contained by the barrel, will be determined by the shortest slate. Similarly, the health of a tree will be determined by the element or abiotic condition, relative to the other plant nutrients will be in short supply.

What are soils—bonsai soils.

What are the plant nutrients?

Plant nutrients are chemical elements and compounds necessary for plant growth, reproduction and metabolic processes.

There are a wide variety of nutrients, which can be grouped by the amounts needed for normal growth. The first are the nutrients required in large quantities, referred to as the macro elements. Secondly, are the micro-nutrients required in small quantities. Although taken up in small quantities, they are vital for healthy and normal growth.

Macro nutrients

In normal growth there are the elements taken up in large quantities through normal processes such as photo-synthesis. Carbon dioxide is taken up by the plant leaves along with water in the presence of sunlight to pro-duce sugars.

Then there are other nutrients taken up by the plant from the growing medium. These can be sub-divided by the quantity needed by the plant. Macro elements include Nitrogen (N), Phosphorus (P) and Potassium (K). Secondary macro-nutrients include Sulphur (S), Calcium (Ca) and Magnesium (Mg).

Table 1. Functional roles and foliar deficiency symptoms of the macronutrients (de Bang *et al*. 2021)

Nutrient	Dry matter%	Functional roles	Phloem mobile	Deficiency symptoms	Symptom
Nitrogen	1 to 5	Macromolecules (proteins, nucleic acids, chlorophyll, organic metabolites	Yes	Chlorosis (yellowing) of oldest leaves, stunted growth, small leaves, reduced shoot branching	Acropetal
Phosphorous	0.3 to 0.5	Energy store and transfer, roots	Yes	Anthocyanosis: purple leaves or dark-green leaves	Acropetal
Sulphur	0.1-0.5	Metabolites, and cells		Chlorosis of youngest leaves, stunted growth, red leave	Basipetal
Potassium	1 to 6	Osmotic regulation, stomata,	Yes	Chlorosis on tip of oldest leaves, that develop marginal necrosis (dying -off), slack appearance due to poor cell pressure.	Acropetal
Calcium	0.2 - 2	Structural cell wall membrane	No	Disintegration of root tissue, Necrotic lesions on leaf edges, leaf deformation,	Basipetal
Magnesium	0.1 - 1	Central element in Chlorophyll, Energy transfer	Yes	Inter-venous chlorosis on oldest leaves that eventually develops into full necrosis (yellowing)	Acropetal

Symptoms: Basipetal- first appears on youngest leaves, Acropetal- symptoms appear on oldest leaves

What are soils—bonsai soils.

Nitrogen

- The chlorophyll molecule has four nitrogen molecules in the middle and one magnesium. This is why if there is a shortage of N and Mg the plant shows the deficiency by having yellowing leaves, starting with the older leaves. Further, it is part of the DNA, RNA and amino acids which make up proteins.
- Is the element that is most dynamic as it is leached easily and /or degraded by the process referred to as denitrification leading to volatilization (lost as a gas). It can be applied as a fertilizer, inorganic or organic, and it would be a source from compost or manure. Compost or manure would act like a slow-release fertilizer.

Excess of nitrogen can lead to excessive growth, While, deficiencies will lead to chlorosis (yellowing) of the older leaves, reduced root branching, elongation of lateral roots, reduce leaf size, and reduced branching.

Sources of nitrogen would be from fertilizers, organic or inorganic, and fixation by legumes such as the Acacia trees (de Bang et al. 2021).

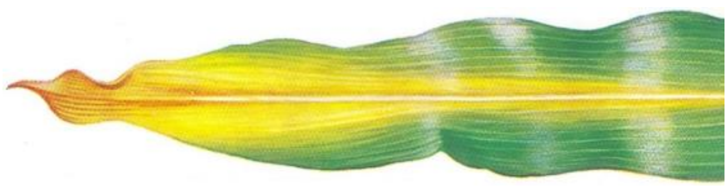

Figure 3. Nitrogen deficiency in the maize leaf. Note the chlorosis (yellowing) starts at the tip and forms a V-shape on the older leaves (van Rensburg, 2004).

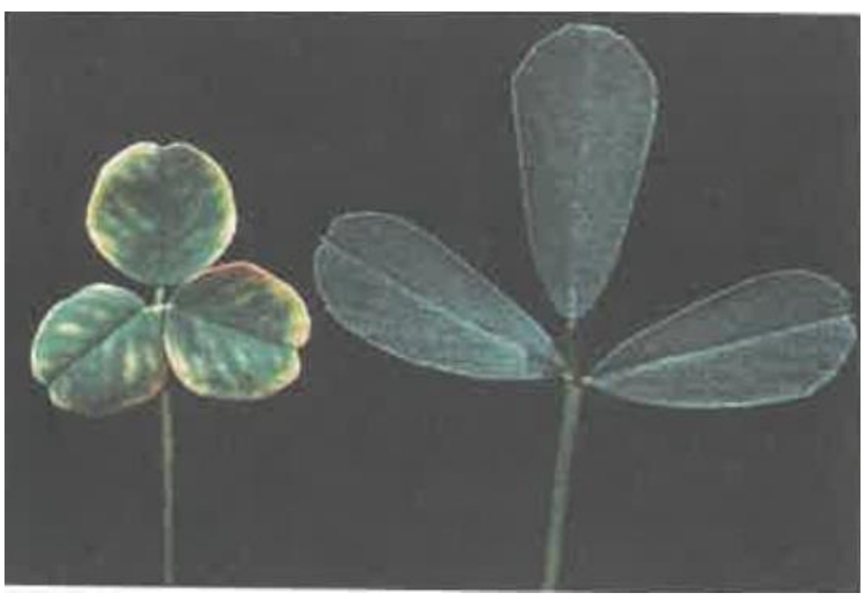

Figure 4. N deficiency in lucerne. Chlorosis occurs initially on the edges of the lower (older) leaves. Necrosis (die-off) of leaf edges and entire leaf occurs as plant matures. Normal plant leaf on the right (Havlin *et al*. 2005).

What are soils—bonsai soils.

Phosphorous

Phosphorous is an essential element in the light reaction of photosynthesis, thus integral in the biomolecules (ATP, nucleic acid and DNA) for energy transfer – essential for the functioning of a plant. It is predominantly taken up in the inorganic form (H_2PO_4- and HPO_4^{2-} depending on the pH)

Deficiency of Phosphorous is indicated by a wide range of plant species by reddening of leaves, stems. In tomatoes it is the underside of the leaf. Further the deficiency of phosphorous can lead to increased root length and root hair density – a defense mechanism to increase the possible uptake of phosphorous. (Havlin *et al*. 2005).

Figure 5. The reddening of the leaf edge. The intensity of the deficiency is indicated by the amount of reddening (van Rensburg, 2004).

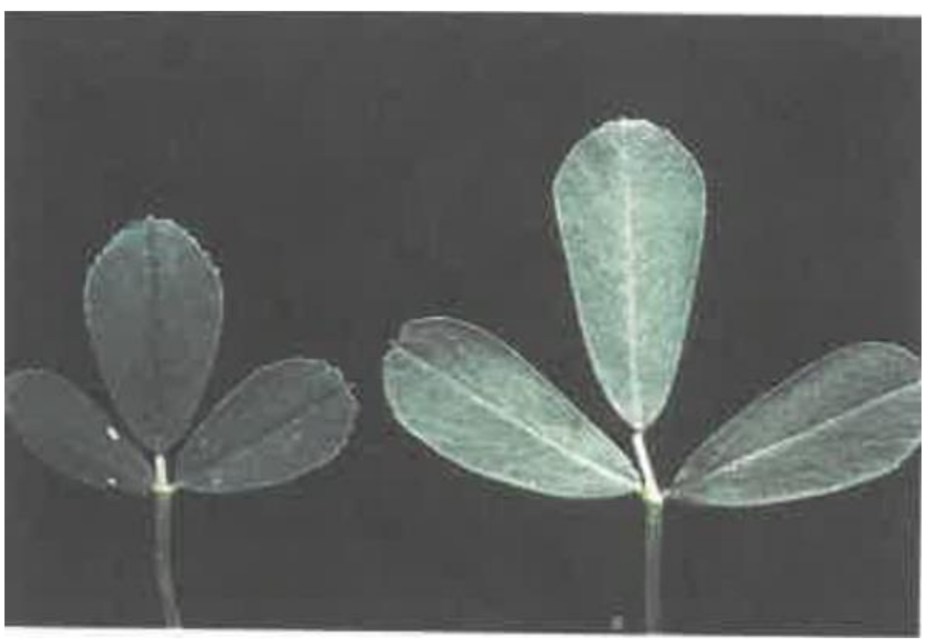

Figure 6. P deficiency in lucerne. Plant is stunted and older leaves are small and exhibit dark green to purple discolouration – normal plant leaf on the right. (Havlin et al. 2005).

What are soils—bonsai soils.

Potassium

Unlike N and P, potassium is not a component of biochemical compounds in the plant. Rather, it has functions particularly related to osmotic pressure of cells. In fruit and vegetables adequate potassium enhances fruit size, colour, taste and peel thickness, which is important for storage and shipping quality.

Potassium deficiencies influence metabolic processes primarily involved with photosynthesis.

Figure 7. As with the phosphorous deficiency, the leaf outer edge shows signs of yellowing, with die-off from the outer edge (van Rensburg, 2004)

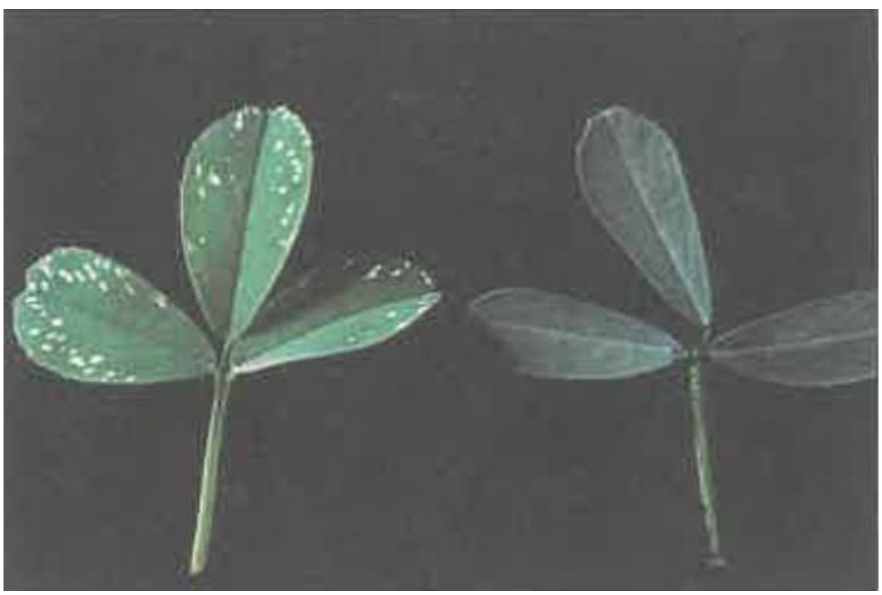

Figure 8. K deficiency in lucerne. Small white spots occur along the leaf margines, although yellowing of leaf edges can also occur – normal leaf on the right (Havlin et al. 2005).

Sulphur

Sulphur is absorbed almost exclusively through the roots, and small quantities through the leaves.
Sulphur occurs exclusively in the plant as amino acids. When there is a deficiency, an excessive accumulation of nitrogen in the leaves occurs. This in turn will result in reduced food quality. Although sulphur is not part of the chlorophyl molecule, it is required for the synthesis of chlorophyll.

What are soils—bonsai soils.

Calcium

Calcium (Ca) deficiency is generally uncommon but can occur if there is excessive leaching. Calcium is adsorbed predominantly from the soil. Ca deficiency can lead to cell wall weakness, which can lead to poor nutrient uptake.

Magnesium

Magnesium, like calcium, is adsorbed from the soil solution. About a quarter of the magnesium in a plant is in the chlorophyll molecule. Further it is an important component for energy transfer reactions in the plant.

Manure as a fertilizer (Jezile & Beukes, 2004)

A question I have been often asked is the nutrient value and composition of manure. It varies considerably depending on the kind of animal, its age and nutritional quality of the diet (Scholtz. 2020). Further the age of the manure and how long it has been exposed to leaching and the elements.

What is the chemical composition of cattle manure

Below is an example manure analysis of a dairy farm and cattle grazing in the veld, including planted and fertilized pastures.

Note: South African soils are inherently low in phosphorus, which will result in manure low in phosphorous if the animals graze on the natural veld. Secondly note the low levels of calcium and magnesium. This I will expand on the next article in the series.

Table 1. Nutrient composition of dairy manure (mg/kg)

Manure type	Total Nitrogen N	Ammonia NH4-N	Phosphorous (P2O5)	Potassium K2O
Lot-scraped manure (g/kg)	4.5	1.4	2.7	4.1
Range	1.4 - 9	0.9 - 6.8	0.3 - 5.8	0.9 - 9
Source: compiled from various local and international references				

Manure	Ca	Mg	Se	Na	Fe	Mn	B	Zn	Cu	Cl
Lot-scraped manure (g/kg)	2.3	1	0.8	0.6	0.4	0.04	0.004	0.04	0.009	1.5
Note: Ca= Calcium, Mg= Magnesium, Se Selenium, Na= Sodium, Fe=Iron, Mn= Manganese, B= Boron, Zn = Zinc, Cu = Copper, Cl = chlorine										
Source: compiled from various local and international references										

What are soils—bonsai soils.

What type of fertilizer can manure be compared to

It depends on the chemical analysis.

In the above example it would be equivalent to a 3:2:3 chemical fertilizer (for the dairy manure).

In the Eastern Cape the manure was found to be 3:1:4 (3). The (3) indicating that for every 100 kg of manure there is 3 kg of nitrogen, 1 kg of phosphorous and 4 kg of potassium.

How much manure needs to be applied to the soil in comparison to the more concentrated chemical fertilizer? A rule of thumb is about 10 times.

What are the benefits of applying manure?

Manure has many benefits including supplying macro- and micro-plant nutrients like a slow-release fertilizer, organic material, holds water, has a high CEC (Cation Exchange Capacity) which will help hold plant nutrients and reduce leaching; retain soil structure and a source of microbes, as well as a source of food source for the microbial community.

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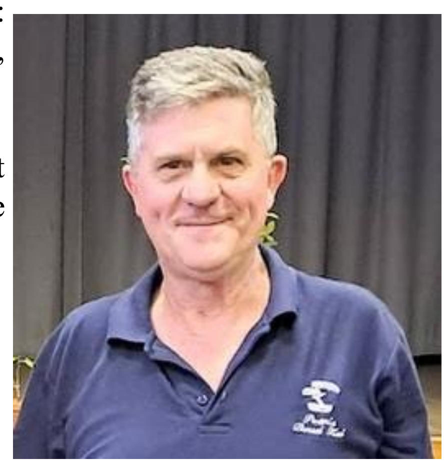

Bonsai Kalender — Deur Francois van As

Wat doen ons in November en Desember?

November word beskou as laat lente terwyl Desember die somer inwy. Die tabel hieronder toon dat warm temperature ons voorland gaan wees, wat beteken dat die grond in ons bonsai potte vinnig kan uitdroog. Watertoediening is dus van uiterste belang. Lig speel 'n belangrike rol in die ontwikkeling van lote en moet buitenshuise bonsai gereeld gedraai word om enige wanbalans in takvorming te voorkom. Doen gereeld inspeksie en pas konstante verfyningsnoei toe. Die lote van bladwisselende bome kan teruggesnoei word tot een of twee pare blare wat vertakking en die verkleining van blare teweeg sal bring. Nuwe groei by naaldblaarbome moet ook konstant teruggepluk word. Indien daar gevoel word dat jong takkies nou reeds bedraad moet word, moet daarop gelet word om die draad nie te styf om die takkie te draai nie. Die vinnige groei wat nou plaasvind sal maak dat die draad maklik insny. Dit is 'n belangrike tyd van die jaar vir voeding en die meeste bome moet regdeur die somer bemes word. Bladwisselende bome kan seewierekstrak (Seagro), 2:3:2 en L.A.N afwisselend elke maand ontvang terwyl Naaldblaarbome 3:1:1 of seewierekstrak toegedien kan word. Warm, vogtige toestande bevorder peste, hou dus dop en behandel vroegtydig.

Bonsai-groete

Francois

Hoe lyk Pretoria se klimaat hierdie tyd van die jaar?

Pretoria het 'n gematigde savanne (grasvlakte) klimaat met warm, nat somers en droë winters. Van Mei tot September reën dit selde en wanneer wel, is dit maar min.

Maand	Gemiddelde maksimum temperatuur (°C)	Gemiddelde minimum temperatuur (°C)	Gemiddelde ure sonskyn per dag	Gemiddelde aantal dae neerslag per maand	Gemiddelde mm neerslag per maand
November	27	16	9	12	61-100mm
Desember	28	17	9	15	101-200mm

Bron: http://www.whatstheweatherlike.org/southafrica/pretoria.htm

Sorgskedule / Maintenance Schedule	**Seisoen: Season:**	Vroeg lente Early spring	Mid-lente Mid-spring	Laat lente Late spring	Vroeg somer Early summer	Mid-somer Mid-summer	Laat somer Late summer
Maand / Month:		**Sep**	**Okt / Oct**	**Nov**	**Des / Dec**	**Jan**	**Feb**
Die boom se jaarsiklus The tree's yearly cycle		Herontwaking, nuwe groei Reawakening, new growth			Nuwe groei New growth	Kort dormante periode, konsolideer nuwe groei Short period of dormancy, consolidate new growth	
Aksie / Action	Bonsai van saad Bonsai from seed						
	Bonsai van steggies Bonsai from cuttings						
	Verplant / Potting						
	Herpot met wortelsnoei Repot with root pruning	Immergroen en bladwisselende bome Evergreen and deciduous trees					
	Vormsnoei Formative pruning						
	Knyp groeipunte Pinch growth points						
	Bemesting / Fertilizer						
	Insekdoders / Insecticide						
	Somerbeskerming Summer protection						
	Winterbeskerming Winter protection						

Seisoen: Season:		Vroeg herfs Early autumn	Mid herfs Mid autumn	Laat herfs Late autumn	Vroeg winter Early winter	Mid-winter	Laat winter Late winter
Maand / Month:		**Mrt/Mar**	**Apr**	**Mei/May**	**Jun**	**Jul**	**Aug**
Die boom se jaarsiklus The tree's yearly cycle		Bery voor vir dormante periode Prepare for winter dormancy			Dormant gedurende die winter Winter dormancy		
Aksie / Action	Bonsai van saad Bonsai from seed	Vir beste resultate gebruik vars saad For best results, use fresh seed					
	Bonsai van steggies Bonsai from cuttings						
	Verplant / Potting						
	Herpot met wortelsnoei Repot + root pruning		Immergroen bome Evergreen trees				
	Vormsnoei Formative pruning						
	Knyp groeipunte Pinch growth points						
	Bemesting / Fertilizer						
	Insekdoders / Insecticide						
	Somerbeskerming Summer protection						
	Winterbeskerming Winter protection						