# APEX NURSERY FERTILISER

# CUSTOM BLEND FORMULATION PROGRAMME

## CUSTOM BLEND FORMULATIONS:

### *ADVANCED GRADE SPECIMEN TREES:*

The stock is grown in 45Lt or larger containers having been potted on from pb28 or 40.
The client requires extension growth and calliper gain in year 1 post potting but only calliper gain in year 2 so as to avoid having to re-pot prematurely.
***APEX 'Endure" 16+2+9*** 14-15m Full encapsulated CRF
***APEX 'Evolution' 21+3+6.2*** 8-9m Dual blend slowly soluble granule + encapsulated CRF
This combination delivers staged release at an elevated level for the 1st year post potting with a step down in nutrient delivery in the 2nd year whilst still maintaining plant quality and calliper gain.
The precise rates of use depend upon the plant species, potting mix, irrigation and local climate.

### *NZ NATIVES :*

Seed is direct sown or seedlings pricked out into root trainers in the Spring. Finished stock is sold for vegetation planting the following Autumn/Winter. The plants need to be stocky & tough to ensure survivability post planting.
***APEX 'Exceed' 15+2+9+Te*** 12m Full encapsulated homogenous CRF
***APEX 'Exceed '16+2+10+Te*** 3m Full encapsulated homogenous CRF
***APEX Special 'K' 0+0+38*** 6-7m Full encapsulated CRF
This combination delivers staged release with a fast but ultra safe early start with extended Potash support through to mid/late season growth and further longevity right through to and beyond planting out. The homogenous components ensure uniform distribution in the small root trainer discrete cavities give even grade plants from each cavity.

### *CITRUS:*

Super grade growing on stock is potted up into deep Pb's and grafted in pot when stem calliper allows. The grafted plants are then grown on until large enough to plant out. Potting to planting takes typically 18 months. The crop is started under poly tunnels and finished outdoors The plants must have deep green foliage and attain a calliper onto which a graft can be made as early as practicable.

Citrus are semi-subtropical and show very little growth response in temperature less than 15c.
***APEX "Endure'*** 16+2+9 14-15m Full encapsulated CRF
***APEX ' Evergreen'*** 20+3.4+6.6+Te Full encapsulated CRF
***APEX Special 'K'*** 0+0+8 6-7m Full encapsulated CRF
This combination delivers an N;K ratio and a temperature response tuned to the growth pattern of the Citrus plant. As growth is low in cool temperatures the nutrient flow is targeted for when temperatures rise. Later season growth is catered for by the extended release CRF . The schedule of release of nutrients ensure consolidated growth with short internodes and thick dark green foliage

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Growing woody ornamental plants in containers is a demanding occupation which combines a variety of practical skills and scientific knowledge.

Controlled release fertiliser technology has come along way since it's inception in the early 1960's when it revolutionised crop nutrition. The range of products available are extensive however they are broadly comprised of similar NPK analysis and longevities.
This is not surprising when you consider that successful commercial offerings are going to cater for the majority rather than carry the expense of a multitude of individually preferred formulations sold in relatively low volumes. For the multi nationals it simply does not make economic sense.

So the reality, until now , has been that one size, broadly, fits all!

Well McHort offer an affordable solution with bespoke custom blend formulations designed, tried and tested here in New Zealand for local conditions and nursery practices.
Using our unrivalled practical knowledge we can formulate fertilisers to exactly meet the NPK requirements of any given crop and a schedule and duration of release to meet the growers needs precisely.
Our blending plant is small enough to economically produce small runs of just a few bags but large enough to cope with multiple pallet volumes.
We have access to an extensive range of fertiliser release technologies, soluble, slow release and encapsulated controlled release formats plus several NPK +Trace element formulations give us a palette of options with which to produce an almost infinite range of offerings.
Each formulation comes with a comprehensive nutrient analysis declaration and details of the release schedule.
Obviously having so much choice can be daunting. Exactly how do you choose.
McHort guide you through the options discussing you crops needs , your unique production preferences and conditions and of course the cost.
You'll be surprised how affordable a bespoke custom blended fertiliser package can be and indeed how easily you can have exactly what you want and need even in quite small quantities.

Our suppliers are leading players globally in the production of the finest quality and leading edge technology fertilisers. Our extensive horticultural knowledge and understanding of local practices and conditions make us a formidable team.

Check out some of the bespoke custom blend fertiliser formulation we currently have in production. We have attached a simple explanation as to the clients specific requirements in each case.

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NURSERY 'KNOW HOW' :
#3 Quality Potting Mix

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**Quality Potting mix** is, put simply, the inter-relationship of three key factors, chemical, physical and biological, precisely defining a potting mix. Quality results when the correct balance of suitable stable components and ingredients are used.
Quality is compromised even when superior components are selected if the critical blend and balance is not correctly engineered.
Not all potting mixes are equal and not all potting mixes are capable of growing quality plants. You should specify to your supplier exactly what you require and be prepared to check the accuracy attained regularly.
Mix specification and consistent adherence to the specification is critical.

A more detailed look at each key factor will illustrate quality issues.

**Chemical properties** are expressed and measurable as pH, conductivity, Nitrogen stability, toxicity, nutrient balance, amount and longevity.

**pH**
Most ornamentals are happy in a mix pH 6 - 6.5 (5 - 5.5 for acid lovers). Adjustment of mix pH is achieved by adding calculated amounts of liming materials; e.g. Ag. Lime and Dolomite lime. Each variant in base mix components; i.e. bark to pumice ratio, has the potential to change the liming requirement to achieve the same pH point. Low levels of lime input may require additions of Calcium as Gypsum and/or Magnesium as Kieserite to ensure adequate supply of these elements to your crop. Small particle sized liming materials will alter mix pH faster but may not hold it in the desired range for long enough. Use liming agents with fine particle size for short term crops and a mixture for longer term crops.

**Conductivity** or soluble salts level in your mix should not exceed Ec. 2.0 when potting pot grown G.O.L.'s, Ec. 1.6 if potting up cuttings or seedlings.
Ec. is quantified using a 1:1.5 water extract method. Fertiliser type and rate has a bearing on the salinity generated. Soluble types are very fast acting with poor longevity and a high salinity risk. Slow release and coated types are longer lasting and produce less salinity. Blending different fertiliser types may be advantageous but must be used on an informed, thoroughly trialled basis.

**Nitrogen stability**, especially in relation to composted mix ingredients, is laboratory tested and reported as N.D.I. Look for a result 0.7 - 1.0 N.D.I., but always read in conjunction with Ec. The result can be fudged by high soluble Nitrogen fertiliser additions. A high salinity reading may indicate this.

**Toxicity** is assessed by sowing fast germinating seeds and counting emergence and survival. The most common causes of toxicity are by-products from incomplete composting, too much soluble fertiliser or contaminations. Woody, more mature plants are more tolerant than young tender seedlings. Ammonium toxicity is a problem in cool Spring conditions for a number of annual seedling crops. The toxicity is often as a result of using either Urea or ammonium fertilisers at too high a rate. A laboratory test will identify Ammonium toxicity. Levels of Ammonium greater than 50 ppm are of concern.

**Nutrient balance**, amount and longevity relates specifically to your crop, vigour, stage of growth, cultural practice and, ultimately, how much you want to spend. Significant savings can be made with careful and informed selection.
Crop performance can be seriously depressed by getting the equation wrong, by either too much or too little!

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**Physical properties** to consider are Water Holding Capacity, Air Fill Porosity and component stability. These factors describe the precise relationship of air to water to solid matter in a given mix. The W.H.C. is an expression of total water held in a mix after draining. Selected components in the mix should remain stable for the entire production cycle of the crop and not be prone to excessive breakdown or shrinkage. Most crops will be happy with 45-55 WHC and 18-25 AFP. Container shape and size should be considered when engineering the growing media. Shallow containers with a large relative surface area can accommodate a lower AFP and higher WHC especially when growing annual seedlings at a high density; e.g. annuals in punnets or cell trays.

**Irrigation management** has a powerful effect on crop performance, so your management capabilities and how they relate to the potting mix are equally critical. Re-wettability of a mix is a serious issue. Most consider re-wetting agents as essential. Add one with your fertiliser inputs. The rate applied will determine how long it remains effective. Use a rate of 0.5kg/m3 for short term crops and 1kg/m3 for longer term woody crops. Higher rates offer little tangible benefit. Granular formulations are preferred to liquid forms. Liquid forms require repeated applications and increase the risk of crop injury due to toxicity. Ultimately, plant roots fill the air spaces that would potentially fill with water. No amount of wetting agent helps!

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**Heat in a fresh mix is a healthy sign**
Temperatures above 35—40 C, however, will need careful management.
Spread out a hot heap to dissipate the heat. Apply cooling water, if necessary. Avoid building any potting mix into a heap higher than 1.5m.
A bark based mix that is delivered and remains cold is of far greater concern! The lack of heat might indicate very little microbial activity and a consequent lack of disease suppression.

**Microbial issues**
A good mix will be rich in diversity and amount of beneficial organisms, fungi and bacteria. The composting process not only enriches beneficials, but also usually reduces the pathogen population. This is a significant and real bonus not usually associated with peat mixes. Composted materials are probably less likely to contain either pests or weed seeds. The pasteurising effect during composting usually takes care of that. Additional beneficials can be added to any potting mix. *Trichoderma* is one such organism, more are becoming available. These include bacteria, amino acids, brassinosteriods and glycosides. McHort are developing uses for a number of commercial products in this area including Seamac PCT, Numax, Terra-Sorb and VitaZyme.
Bark and wood waste composted mixes will support larger and more viable populations than peat based mixes.

**Impartial, quality, advice** is available from McHort. We don't make or sell potting mix, so you can be sure that we will only recommend a potting mix specification for your exact needs. Call today for a free consultation; our knowledge and experience in this field is simply unrivalled.

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NURSERY 'KNOW HOW' SERIES : #3 QUALITY POTTING MIX

NURSERY 'KNOW HOW' :

**#4 FERTILISERS IN POTTING MIXES**

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**The challenge.**

Feeding plants in a container using a soil-less potting mix is a precise task. The plant must have all it needs within the contained root run and it must ideally remain available for at least the duration of the production phase.

**Fertiliser types described.**

'Controlled release' fertilisers have revolutionized container culture. Many fertilisers justifiably claim to be 'controlled release' and yet the range of formulation chemistry across the various brands is significantly different. Essentially we tend to describe this whole group as being slow release fertilisers.

**The release mechanisms.**

Will involve utilizing one or more, or all of the following properties:

Low solubility, biological degradation or encapsulation of soluble fertilisers.

Not all are suited to container production.

**Low solubility fertilisers**

Are perhaps the least favoured due to the large volumes of irrigation and rainfall associated with outdoor crops. Much of this type of fertiliser will wash through and out of the container before the plant can use it.

**Biologically degradated fertilisers**

Are less than perfect in this context of use. Essentially the only chemical nutrient element which can claim to provide a slow release through biodegradation is Nitrogen.

Soil microbes and bacteria convert either organic or inorganic Nitrogen to either, or both, Ammonium or Nitrate Nitrogen which plants can then utilize. The limitation is that first there must be substantial microbe populations present and maintained in the potting mix to perform this function.

This requires a delicate balance of moisture, salinity, pH, and temperature. Such fertiliser has limited appeal in our container culture.

**Encapsulated soluble fertilisers**

The encapsulation material may be an organic or synthetic polymer. Prills of soluble fertiliser are coated with a layer of the polymer. Water can be drawn into the coated fertiliser prill due to the permeable nature of the coating.

Release occurs through microscopic cracks or pores in the coating which itself expands or contracts in response to temperature. Higher temperatures and expansion create larger openings from which the fertiliser inside is pushed out. This effect is described as an Osmotic pump. Lower temperatures cause contraction and limit release. A thicker coating extends the term over which release occurs.

Encapsulated fertiliser is your best option . But which one and why?

**The selection criteria.**

Consider in turn the following 7 criteria:

1. Nutrient analysis
2. Release pattern
3. Longevity
4. Rate of use
5. Safety
6. Availability
7 Cost

**Nutrient analysis**

The ratio of the N, P& K are relative to :

***A. The potting mix composition***

***B. The plant species being grown***

Nitrogen is the key driver as far as plant size is concerned. Put simply, low N will result in smaller slower growing plants. Excessively high N may produce soft, weak and stretched growth. In New Zealand fertiliser analysis is expressed in the elemental form; e.g. 21+2.1+9.9. Overseas the same analysis is reported in the oxide form; e.g. 21+5+12.

The ratios of N:P:K for woody stock production may range from 2.0:1:5 - 4:1:5 If you use a Bark based potting mix, pot all year round and grow mostly vigorous species, the best choice would be close to a 2.0:1:5 ratio. Use a higher N ratio in bark than peat.

European products are tuned to peat mixes, deciduous species and a short production season from Spring potting .

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**#4 FERTILISERS IN POTTING MIXES**

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New Zealand conditions and practice require a different approach.
Trace element content is also important.
New Zealand potting mixes and the mainly evergreen species we cultivate call for more Iron, particularly, than that contained in the European source fertilisers. Phenols in bark disrupt Iron availability . To overcome this we should have extra Iron in our fertiliser compared to those used in peat. Plant species sensitive to Phosphorous need a special low P formula. Plants in this group include many South African and Australian natives and Citrus.

**Release pattern.**

Deciduous plants require plenty of fertiliser delivery immediately after breaking dormancy. Failure to supply this will compromise growth potential. These plants grow strongly through Spring and early Summer but should have all the Nitrogen supply exhausted by early Autumn to allow for Winter conditioning.
The best release pattern for these plants is therefore more early and less later.
Conversely evergreen species put on most growth in late Summer and early Autumn.
Too much fertiliser delivery in Spring is undesirable. Field grown wrenched and containerized stock responds best to a low initial fertiliser delivery whilst it recovers from wrenching with more later for optimum growth.

**Longevity.**

Select product longevity in consideration of the anticipated time required to produce a saleable plant plus a few months extra to give some "shelf life". It is rare to market a whole production batch in one month and retailers do appreciate plants that hold condition.

**Rate of use.**

Longevity influences the rate of use.

In general terms the industry uses 0.5kg/ cubic metre of mix for each month in the longevity selected; e.g. 9 month longevity is used at 4.5 kg/cubic metre.
Fine tuning can produce even better results and, of course, lower rates will cost less. Carefully weigh-up the cost of a high input rate versus topdressing later after using a lower base input. You might find the later course is better value!

**Safety.**

Simply follow the manufacturers' guidelines on use. Encapsulated fertilisers have an excellent safety record. Beware of formulations that include some soluble or starter feed. These are sometimes called 'Fast start'. The quick release of fertiliser can burn roots. You must not 'Dibble' apply this fertiliser format.

**Availability.**

Some manufacturers and suppliers boast very large ranges of fertilisers. In a market the size of New Zealand it is impractical, costly and unnecessary to offer much more than 12 variants. The inevitable consequence is 'stock outs' and/or passing on the extra cost of slow moving stock to you .

**Cost.**

Some brands carry a premium price but not necessarily any performance benefit. You may just be paying for multiple Middle men taking their cut, funding flash company vehicles, expense accounts and frivolous advertising . Trial an alternative less expensive brand, you might be pleasantly surprised!
Check out not only the cost per bag but the cost of use per cu.m. of mix.

**Are you paying too much?**

If you are currently paying more than $ 30 / cubic metre for the fertiliser in your mix to produce a nine month crop you could be paying too much!
**Free advice** is available from McHort, just call us!

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NURSERY 'KNOW HOW' :

# #5 NUTRITION

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Many fertilisers justifiably claim to be 'controlled release' and yet the range of formulation chemistry across the various brands is significantly different.
Essentially we tend to describe this whole group as being slow release fertilisers.

**The release mechanisms.**
Will involve utilizing one or more, or all of the following properties:
Low solubility, biological degradation or encapsulation of soluble fertilisers.
Not all are suited to container production.

**Low solubility fertilisers**
Are perhaps the least favoured due to the large volumes of irrigation and rainfall associated with outdoor crops. Much of this type of fertiliser will wash through and out of the container before the plant can use it.

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Soil microbes and bacteria convert either organic or inorganic Nitrogen to either, or both, Ammonium or Nitrate Nitrogen which plants can then utilize. The limitation is that first there must be substantial microbe populations present and maintained in the potting mix to perform this function.
This requires a delicate balance of moisture, salinity, pH, and temperature. Such fertiliser has limited appeal in our container culture.
Combinations of low solubility and bio-degradated fertilisers are a commercial reality and are often sold simply as slow release fertilisers. It is subjective that these can be described as controlled release fertilisers.

**Encapsulated soluble fertilisers**
The encapsulation material may be an organic or synthetic polymer. Prills of soluble fertiliser are coated with a layer of the polymer. Water can be drawn into the coated fertiliser prill due to the permeable nature of the coating. Release occurs through microscopic cracks or pores in the coating which itself expands or contracts in response to temperature. Higher temperatures and expansion create larger openings from which the fertiliser inside is pushed out. This effect is described as an Osmotic pump. Lower temperatures cause contraction and limit release. A thicker coating extends the term over which release occurs. Encapsulated fertiliser is your best option .But which one and why?

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If you use a Bark based potting mix, pot all year round and grow mostly vigorous species, the best choice would be close to a 10:1:5 ratio. Bark can 'draw down' Nitrogen leaving your plants short a pale.

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Use a higher N ratio in bark than peat. European products are tuned to peat mixes, deciduous species and a short production season from Spring potting . New Zealand conditions and practice require a different approach.
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**Cost.**

Some brands carry a premium price but not necessarily any tangible performance benefit. You may just be paying for multiple layers of inefficient managers and administrators, flash company vehicles, expense accounts, frivolous advertising and poor service and advice. Also watch out for the so called loyalty schemes designed to lock you in. They often indicate a brand under threat from more realistically priced competitors. Trial an alternative less expensive brand, you might be pleasantly surprised! Check out not only the cost per bag but the cost of use per cu.m. of mix.

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