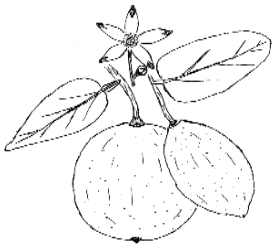

Limette

Newsletter Citrus Friends Europe **Issue 10**

Citrus Fertilisation

Citrus needs to be feed. A light sandy compost, which should be used is often infertile, and a deep rich compost may have the backdraw of inadequate drainage the compost.

This is also commonly found in the ochards: Light sandy soils have good drainage, but are infertile and lacking organic components in the ground. Deep fertile soils are often sticky, loamy and not realy well drained.

In the groves the fertilisation program is made by soil sampling before planting, and after planting through leaf analysis. The leaves were randomly collectect thoughout the whole ochard, mixed and send to a certificated laboratory. Here the leaves will be indexed for the nutrient content. A special nutrient content table shows if the nutrient contents in the sample are in the desired range, or if any correction is need.

Commonly for the groves a fertilisation program at annual sheme is set and maintained.

Fertiliziers for commercial use

Those materials are often compressed organic matters, in form of granular or pellet sources. Also mineral salts are available in form of granulat sources. For each nutrient organic as well as mineral sources are available, but often the different nutrients are mixed to a compound fertilizer, were the nutrient content is shown at the fertilizer label.

Commonly the mixture is found in form of a three digit code. The three numeric indicators label first the amount of nitrogen, followed by the phosphorus content, next it the potassium amount labeled. Some fertilizers have a forth label, which indicated the amount of magnesium in the mixture. Additional nutrients are labeled below expressed as percentual amounts.

So if a fertilizer shows a three digit label of i.e. 12-3-12 , it labels a 12 per cent amount of nitrogen, 3 per cent of phosphorus and 12 per cent of potassium in the ready to use fertilizer mixture. Also granular sources set free this amount of percent nutrients if the labels shows the same and as the granular source dissolve with water.

Mineral fertilizers are also available as liquid sources, and if added to irrigation systems these liquid sources provide best nutrient supply to the root system, because with the irrigation water the nutrients cover by sprinklers or drippers a large root zone of the upper feeder roots. Also amount of fertilizer can be adjusted very fine, so leaching and salt damage can be avoid.

Citrus in containers

As for common groves, also the potting mix for citrus in containers can only provide nutrients to the plant for a couple of weeks. After that point, the nutrients are used up and feeding of the plants is neccessary. In nurseries the vigorous growth of the seedlings for further propagation is neccessary, resulting in often repotting in larger containers with new potting mixtures. These potting mixtures often contain slow release fertilizer or organic fertilizer deposits. Certain mineral and organic compound blends are mixed with the potting compost to provide adequate fertilisation of the young plants.

But some nurseries do not want to depend on slow release fertilizers or deposits in the potting mix, here again a fertilisation sheme is maintained. Most container nurseries irrigate their trees, and inject fertilizer to the irrigation system. This procedure is call fertigation and is common practice.

Nurseries irrigate their rootstock seedlings with high nitrogen and potassium mixtures to provide best vegetative growth to attain bud-able sized as soon as possible.

After budding, some nurseries sell their trees fresh repotted into a large container. These potting mixtures often contain slow release fertizier, to maintain nutrient supply till the customer obtains the tree and starts his own fertilizing sheme.

So trees obtained from the nursery should be

planted as soon as possible, or if further grown in containers, the tree should be repotted and a fertilisation schedule should be established.

Nutrients need by citrus

Citrus needs several nutrients to grow without any visible sign of deficiency. First of all nutrients citrus needs nitrogen. Nitrogen need for proper growth and health, because it is a component in amino acids and proteines. Phosphorus is need for the function of the cell energy system and is structural element of the cell walls, also it supports root development and flowering. Luckily citrus does not require large amount of Phosphorus, because Phosporus will persist in the soil for a prolongued time, and will not leach readily as nitrogen or potassium. Potassium is involved in the ionic balance system of the plant, also it is involved in peel thickness development, and cellular hardiness. Calcium is the most abundant element in the citrus plant. Calcium is essential is cell wall structures and enzyme functioning, as well as for the metabolism transport. But most potting mixes need no calcium sources, because enough lime as calcium source is present in the potting mixture, also irrigation water is often the major calcium source. Only ochards need further calcium to control soil acidity. Now we reach the part of minor nutrient elements, so called micronutrients. Those elements are neccessary for proper plant function and health, but not in the amounts as the elements mentioned before. Magnesium is important for enzyme reactions, Zinc is essential for photosynthesis and chloroplast development. Iron is the most neccesary element in the chloroplast cells, because it works as energy carriers during the photosyntheses process.Further micronutrients are Sulfur, Copper, Boron, Manganese and Molybdenum.

Fertilizer mixture

Fertilizers dissolve in irrigation water or by soil moisture, giving so the nutrients free to take up by the roots. Organic fertilizers need first to be 'cracked' by soil organisms, which will transform the plant unavailable organic material into mineral salts, which only can be taken up by the roots. In containers the soil organisms are often only improperly present, so a bare organic fertilisation will often result in under feeding of the tree. Mineral fertilizers can be taken up readily, but must supplied carefully to avoid salt damage to the roots. Also a fertilizer must be fit for the typical soil reaction. Alkaline soils need nutrients slightly different than acid soils. Soils should be maintained at soil pH of slightly acid, with is expressed be soil pH of 5 to 6,5. If the potting mix or the soil is to acid, add lime. Limestone is the most used soil pH corrector, dolomic limestone is used if even mangnesium is neccesary to the trees. Alkaline soils are often abundant in lime content, so require no liming. Here only high-pH tolerant rootstocks help, to have trees not exhibiting any deficiency symptomes. So for slight acid soils, the fertilizer mixture should express same nitrogen and potassium levels, with posphorus decreased to about 20 to 50 per cent of the nitrogen value. So the Nitrogen value is 1, Phosphorus value is 0,2 or 0,5 and potassium value is agin 1. Boron should contained at maximum levels of 1/300 of the nitrogen level, Magnesium level is 1/5 of the nitrogen level, Manganese is 1/70 of the nitrogen amount and copper should be included only as 1/40 of the nitrogen level. Lower copper dosages should be used, if the plants get copper sprays for fungicide treatment, because as Iron copper is highly alkaline. Iron is required at a level of 1/200 of the nitrogen and zinc should be included at 1/500. Iron can increase to levels of 1/16 and zinc to 1/125 of the nitrogen level, but commonly the potting mixtures or soil contains enough iron and Zinc, so correction is commercialy in ochards only necessary if deficiency symptomes appear. Container grown trees should get low micronutrient dosages, so that the levels in the potting mix will not decrease to rapidly.

Just a word about high pH, calcerous grounds: Here the potassium level should be 1,25 of the nitrogen levels, to provide enough potassium to the tree.

Most fertilizers add acidity to the ground, because nitrogen and phosphorus react acid, and usually both values of these elements in the fertilizer add acid compounds to the ground and expete the values of alkaline micronutrients and potassium values.

How to fertilize

During the summer months one fertilizer application per week is necessary for container grown trees. Commercial ochards use pellets or

granular sources, applied spring, summer and fall to the grove, fertigation is done during each irrigation schedule, or depending on leaf or soil analysis.

Continer grown citrus trees should get fertilizer at high values. Nitrogen values of 10 up to 25 per cent should be included. Those fertilizer mixtures are applied each week once. During the winter, a low dosage fertilizer, with nitrogen levels of less than 22 per cent should be supplied each second watering. As lower the temperature, as less dosage is required. During the summer, an increased nitrogen level, a few digits more than potassium can force proper growth, and is tolerable. But it should never be more than approximately 1,5 of potassium level.

Granular fertilizers should only applied to moist soils, because without moisture these fertilizers will not function properly. Liquid fertilizers should mixed well with the right amount of water to avoid salt damages to the roots. Never add more fertilizer as recommended! Often less is more!

Excess fertilizer leads to root damage, and thus will decrease fertilizer uptake ability of the tree. Salt damage symptomes are visible at the leaves, showing to stop fertilisation immediately and wait with further fertilizer applications, till new growth is free from symptomes. Check the dosage and watch annualy the pH of the compost. If to high, you should irrigate with water containing less calcium and mangnesium. A sprinkle of vinegar to the irrigation water also helps to lower the irrigation water pH. If soil pH is to low, add limestone or dolomite (calcium-magnesium-limestone) to the compost to correct soil pH.

With proper fertilisation a citrus tree will flower and yield well, will grow properly and widstand pests and diseases much better, than suffering trees.

A word of caution at least: Often in shops available citrus fertilizers do contain the nutrients in not for citrus fitting mixtures. To high phosphorus values or potassium values are not seldom found, and the lack of micronutrients is common. Often only iron is added, or the shop keeper sells additional iron fertilizer to the customer. Those iron fertilizers are high alkaline source materials, often leading quickly to salt damages of citrus trees if applied unneccessarily.

So always watch to the content label and check if the fertilizer contains the nutrients in a proper mixture, fit for your citrus tree. Your citrus tree does not look at the label, so if a common flower plant fertilizer, or 'special cactus feed' fit better than the highly priced citrus food, buy it. Your citrus tree depends only onto the nutriends supplied to the roots, and not to the brand or label name. It makes no sense to the citrus tree, if feed with ussuall all-purpose fertilizer or 'cactus feed' if only the nutriends are in the right value and mixture supplied to the tree.

Apply also additionaly micronutrient fertilizers only if realy neccessary and visible by leaf symptomes, often a repotting of container grown citrus works much better than all micronutrient fertilizer applications.

If your nursery or gardencenter sells a fertiliser with does not fit, just do not buy it. Buy another which will fit better.

Citrus Nurseries often make fertilizer in special developed mixtures available for the homeowners, which fit much better to the citrus nutrients demands, than commercial shops do. Real Citrus Nurseries can often provide you with self developed fertlizers, which fit in their and your own demand. Their fertilizers are complete and may fit to your citrus tree. But allways watch the content label, not the name, then decide to buy or leave it.

Recomended reading

The books of Citrus Industry by the University of California are a good source of fertilisation guidelines, but unfortunately unavailable in booksstores, but from the University of Florida the Publication 'Nutrition of Florida Citrus Trees' is still available and can be obtained. The book is made for commercial grove owners, but can be informative for container growers as well.

Also the Book 'Citrus Nurseries and Planting Techniques' from the french CIRAD institute provides additional informations about citrus fertilisation.

Club News

Because of lacking space, the club news chapter will be left away for this issue. Latest news can be fetched from the author or by the club members.

Please stay in contact, Limette No. 11 will may have more space for Club News.