



RAGMANS ORCHARD MANAGEMENT 2017

MINERAL AND MICROBIOLOGICAL APPLICATIONS

The apple season is divided into the “common” growing stages throughout the year. Our interventions are timed according to these stages.

Dec, Jan Feb –	Dormant season
March –	Mouse Ear (tips of the apple buds start to show soft ‘hair’) Green Bud
April -	Pink Bud and bloom
May -	Fruit bud development
June, July, Aug	Intensive growth
Sept, Oct	Harvest
Nov	Post Harvest

1) Very early spring– before the beginning of vegetation until the ‘mouse ear’ stage (End February- March)

Objective.- strengthening the resistance of trees to stressful conditions by making natural hormones interventions after dormant period in winter time; then start to mobilise the Nitrogen in soil, manage mineral deficiencies in soil and also provide minerals required at this stage.



Number of sprays: 2 - 3

Preventive management.-

1.- Salicylic Acid (Stimulate the fitohormonal system; this hormone regulates processes such as seed germination, vegetative growth, photosynthesis, respiration, thermogenesis, flower formation, seed production, senescence) works very well with an application of **Phosphites** (Specific against fungi at this stage) at the same time.

2.- If that's possible to spray **Actinomicetes** with the aim to increase natural plant immune system at this stage before the new buds start to full show. (If we are making Bocashi we can get and reproduce the Actinomicetes from there).

Mineral management.- At this stage **Fe** is quite important nutrient to the plant. It is best to apply early in the spring, under cooler temperatures due to burning risk to plant tissue. At Ragmans we wouldn't need to add it as our historical soil lab test level in Iron shows excess over the last two years, but can be added a spray as the availability to take Fe by plants is low.

Other important nutrient at this stage is **Zn**; the adding of this mineral into our orchard fertilization plan is coming from both sides (mineral deficiency and nutrient requirement at this stage)

P as phosphite from, as preventive fungi disease and deficiency mineral balance

3.- Natives microbes.- 5% enriched with Zn, Fe, Mo and phosphite (Fe will be provided by adding NM with rotten tools to the mix).

2) Green bud (March)

Number of spray: 3-4

Mineral

Objective: to add whole range of macro-micronutrients needed by the tree, also to help to mobilize Nitrogen in soil after winter period (Not adding the minerals which we know are in excess)



- 1.- **Supermagro** 5% (Zn, Ca, Co, Mo, Bo, Cu, P + trace elements) + **limesulphur brew** 1-1,5% (Sulphur) to manage ideal soil levels by increasing soil amount, also to help as catalyst of Carbon chemistry as main function of Sulfur, (*Biochemical sequence, Lovel. Hugh, 2014*)
- 2.- **Selenium**.- 1 liter/hectare as chelated form (Mineral Deficiency)
- 3.- **Native Microorganisms**.- (5%) Enrich with Zn, Molybdenum , Cu + phosphites.

Zn is added as corrector on soil balance through whole season and also as key element between bud break and fruit set.

Manganese is important to whole season; but the mineral historical data showed excess, therefore we are not going to apply unless leaves show deficiency.

Microbiological management

Native microbes spray.- this will increase the microbial activity and diversity within the soil and plant for the new session, mostly by inoculating Plant Growth Promoting Rhizobacteria strains of microbes

Supermagro enriched with Bacillus Subtilis (1%).- Will increase immune system in the plant (to prevent pest and diseases). in soil the benefits are against compaction and to control pathogens. Will start to solubilise and mobilise phosphorous in the soil pool.

Activate Aerated Compost tea. We can possibly spray a whole range of microbes to increase biodiversity for the season (depending on microbiological test)

In case we have some strong pest or diseases, treat with biological spray needed to solve it (Visit pest and disease management section below)

3) Pink bud

Objective.- At this stage (until first fruits bud develop) the level of **Boron** is crucial in plants and fruit development; its role in the *Biochemical sequence of plant nutrients* (Hugh Lovel.2014) is to provide plant cell sap (sugars) pressure, then to activate successive minerals in sequence (See diagram below). So Boron will be added as one of the main elements at this stage.

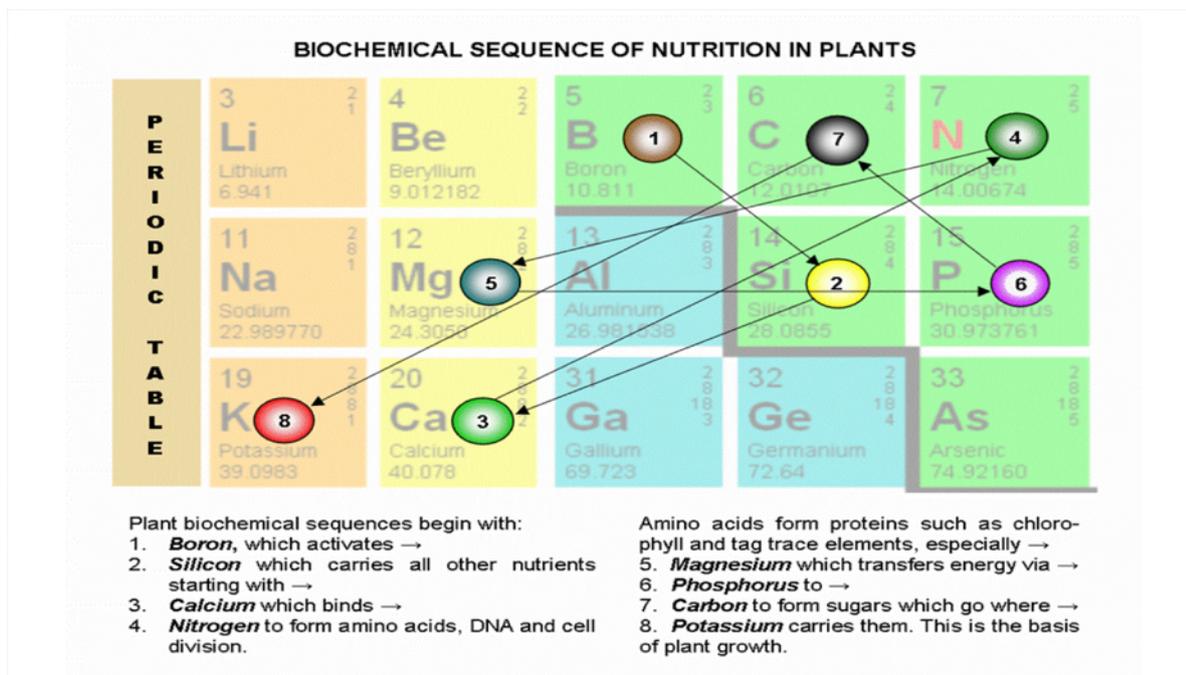


Number of Spray: 2

Mineral management

1.- **Supermagro** 5% (Zn, Ca, Co, Mo, Bo, Cu, P + trace elements) + **limesulphur brew** 1-1,5% (Sulphur)+ **Potassium-** As Hydrolate form 3% (enriched with humic acid) (Mineral Deficiency)

2.- **Native Microorganisms-** (5%) Enrich with Zn, Molybdenum + Boron



Resource: Quantum Agriculture. Hugh Lovel

Microbiology.- As microbial test show
Keep adding microbe strains through
Supermagro (+Bacillus Subtilis) and Native
Microorganism sprays.



4) **Bloom**

Objective.- Improve fruit setting by adding
whole range of macro-micronutrients which are
deficient in the Soil Lab test or Leaf test.

Number of spray: 3

Mineral

Pay attention to **Boron** and check **Calcium** levels in leaves to see if previous sprays cover the slight deficiency in soil; otherwise increase Ca levels by spraying it to build strong cells in the fruit, new shoots, and roots, also as pest/disease management.

Checks **Phosphorous** level at this stage in leaves, just in case the level is low and we should add "extra spray".

1.- **Supermagro** 7% (Zn, Ca, Co, Mo, Bo, Cu, P + trace elements) + **limesulphur brew**
1-1,5% (Sulphur)

2.- **Native Microorganims.** (5%) Enrich with Zn, Molybdenum , Cu + Boron

3.- **Selenium.** 1 liter/hectare as chelated form (Mineral Deficiency)

Microbiology.-Same management that previous vegetative state

5) **After blooming until first fruit buds develop**

Objective

From this stage the availability of **Phosphorous** is quite important in fruit setting and development, therefore we have to keep an eye on levels and add in case its low.

We have to keep checking **Potassium** levels as important for fruit development and ripening.

Add whole range of **macro-micronutrients** and also **trace elements** to cover all minerals needed to fruit set and catalyze all chemical reactions for it.



Number of spray: 2

Mineral

1.- **Supermagro** 7% (Zn, Ca, Co, Mo, Bo, Cu, P + trace elements) + **limesulphur brew** 1-1,5% (Sulphur)+ **Potassium***- As Hydrolate form 3% (enriched with humic acid) (Mineral Deficiency and key element at this stage)
(*Check level of Potassium)

2.- **Native Microorganims.-** (5%) Enrich with Zn, Molybdenum, Boron + Phosphorous

Microbiology.-Same management that previous vegetative state

6) From fruit setting until the common walnut stage

Objective

Same as the previous stage, and also check **Calcium** levels to encourage strong cell division for fruit development and as preventive management against pest and disease.

Numbers of spray: 3-4

Mineral

1.- **Supermagro** 7% (Zn, Ca, Co, Mo, Bo, Cu, P + trace elements) + **limesulphur brew** 1-1,5% (Sulphur)

2.- **Native Microorganims.-** (7%) Enrich with Zn, Molybdenum, Cu , Bo + **Phosporous**

3.- **Selenium.-** 1 liter/hectare as chelated form (Mineral Deficiency)

(*If Copper deficiency level is not solved with Supermagro and Native Microbes spray, possibly treat with 1% Bordeaux brew at this stage)

Microbiology.-Same management that previous vegetative state

7) Intensive growth of fruit buds — June/July/August

Objective.- Same as previous ones with the aim to supply a whole range of key elements for healthy fruit development and solve possible pest and disease through nutrition and biological managements.



At this stage is quite important to increase the levels of proteins, vitamins, org acids in the fruit through the sprays.

Numbers of spray: 2 -3 monthly

Mineral

1.- **Supermagro** 10% (Zn, Ca, Co, Mo, Bo, Cu, P + trace elements) + **limesulphur brew** 1-1,5% (Sulphur)+ (Check **Potassium*** levels)

2.- **Native Microorganism + Salicylic Acid.-** (10%) Enrich with Zn, Molybdenum, Bo, Cu** + Phosphorous

3*.- **Selenium.-** 1 liter/hectare as chelated form (Mineral Deficiency)

*(*Alternate the application of Selenium and Potassium; once each every month, starting with Potassium Hydrolate)*

*(**the application of Cu would be in alternatives months)*

Microbiology.-Same management that previous vegetative state

8) Through fruit harvest —early September/October

Objective: Supply whole range of minerals to recover trees through and after period of harvest

Number of spray: 1-2

Mineral management

1.- **Native Microorganims.-** (7%) Enrich with Zn, Molybdenum and Phosphorous

2.- **Supermagro.-** (Zn, Ca, Co, Mo, Bo, Cu, P + trace elements) + **limesulphur brew** 1-1,5% (Sulphur) + Phosphorous

*(*No when is going to be harvest straight away the variety)*



Microbiology.-Same management that previous vegetative state

9) After harvest - November

Objective: Prepare trees for winter dormant period

Number of spray: 2-3

1.- **Supermagro.-** 7% complete one. (Zn, Ca, Co, Mo, Bo, Cu, P + trace elements) + **limesulphur brew** 1-1,5% (Sulphur)

2.- Natives Microbes + Salicylic Acid 7% Enrich with Zn, Molybdenum and Phosphorous.

*(*If Copper deficiency level is not solved with Supermagro spray, treat with 1% **Bordeaux brew** at this stage to destroy leaves blades and possible pathogens fungal spores)*

Microbiological

Same that previous stages putting attention to possible pathogens fungal spores