BMS MICRO-NUTRIENTS
CHELATED MICRO-NUTRIENTS & FOLIAR FERTILIZERS

Fruit Trees

HYBEROL®

Replenish reserves with Hyberol = assure production

When fruit trees are heavily charged with fruits, it costs them a lot of energy in order to let them all ripe properly. The energy spend this way can naturally not be spend another way, although it already needs to prepare for the next season/year. 200 to 300 days before the full bloom, fruit trees start to prepare and initiate these flowers. This preparation falls together with the period of fruit maturation the previous year. This conflict of interests, within the plant is one of the causes of alternating production in some species of fruit trees. Various factors have an influence on this phenomena such as climatological factors, the variety, the rootstock, the fruit thinning and pruning, soil fertility, light intensity, etc.... but also the plant nutrition and the amount of nutrient reserves in the wood play a role.



Trees, shrubs and other perennials have the capacity to maintain reserves of various nutrients (B, Zn and N) and metabolites (sugars and starch) within the wooden parts (stems and roots). It is important NOT to deplete these reserves completely and to nourish the plant in a well-balanced way which assures maintaining and replenishing these reserves. Once depleted, the plant directs all its energy on the recovery of these reserves and will consequently produce less.

A lot of fruits such as Apple, Pear, Nectarine, Peach (and others of the Rosaceae family as Apricot, Almond, Plum, Raspberry) but also other perennials such as Grapes, Citrus fruits, Olives, Avocado and Mango can suffer from phenomena.

To avoid to the maximum the nutritional factors affecting this problem the department of research and development of BMS Micro-Nutrients designed the product **HYBEROL**. This product contains various elements which help the plant to replenish the reserves and to reduce the alternating production. The post-harvest applications of **HYBEROL** assure a good start the next season as well generative (quantity and quality of the flowers) as vegetative.

02

NUTRITION & RESERVES

Zinc, Boron, Nitrogen and Sugars are the key elements

Boron:

Boron, assures a regular and orderly cell division influencing this way the development of the meristemic tissues in new shoots, roots, and organs such as flowers and young fruits. Boron stimulates flowering, the production of pollen and the cell division which takes place in the young fruits at fruit set. There is a positive correlation between Boron and the quality of the flowers, fruit set and the quantity of seeds in the fruit (important for the fruit quality!). Boron influences together with Zinc the production of auxins, and the translocation of natural plant hormones and also the absorption of phosphorous, an integral element of the nucleic acids.

Symptoms of Boron deficiency are seen mainly on young tissues and apical meristems. The most important symptoms are: deformation of the young leaves and fruits, brown or dry flowers (seemingly burned), bad flowering and fruit set, cracks and corky lesions on the stems, fruits and main nerves.

Zinc:

has a direct influence on the production of the plant hormones (auxins) and therefore on the juvenile development and growth of the plant, the plant height and shoot length, the size of the leaf etc....

Nitrogen and Sugars:

During the last stages of the ripening of the fruits, applications of nitrogen rich products have to be avoided, in order to maintain the fruit quality and not to provoke excessive vegetative growth. But after harvest, foliar applications with nitrogen will stimulate the photosynthesis so that the plant will be able to produce itself the molecules that it will need for its reserves such as amino acids (precursors of reserve proteins) and sugars (such as poliols, precursors of starch). The free sugars and the starch are molecules that the plant use to store energy which it will need and can use during the winter and for the budbreak and sprouting at the beginning of the season.

In many species of fruit trees, poliols are also the preferred chemical form for the translocation of sugars towards the reserve organs like roots, stems and buds. On top of that it are also these poliols that help with the translocation of Boron within the plant towards these same reserve organs.

Another advantage of high sugar concentrations in, above all, the buds is that it will reduce their sensitivity to frost.

During the post-harvest period there is no competition anymore between fruits and other parts of the plant, therefore the plant will be able to concentrate itself completely on the replenishment of the reserves.

Fruit trees also form reserves of N (proteins and amino acids) in the roots, branches and the bark.

4 Nutrients that play an important role on alternating production:

- Boron
- Zinc
- Nitrogen (N), in the mineral form and as amino acids
- Other metabolites such as sugars and starch which serve as energy sources for the metabolic activity during winter and at the beginning of the new season.
- Boron, Zinc and Nitrogen are elements that the tree needs above all during the initial stages of the growth cycle. They need them for as well the juvenile growth as the formation of new shoots, flowers and leaves. Because of the limited activity of the root system at this moment, the plant will first of all use the reserves it has built up. This is exactly why it is important to maintain these reserves at a high level and to replenish them with post-harvest treatments.

Post-Harvest appllications

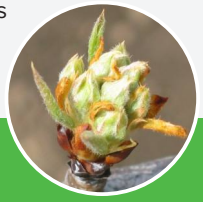
HYBEROL

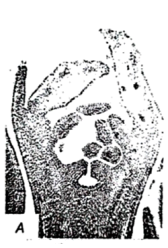
There are various reasons why the post-harvest applications are the best in order to replenish the reserves.

The preparation of the bloom starts many days earlier most of the time in the middle of the previous season. That is why it is important to maintain the tree always in a good and well balanced nutritional condition. Some elements important for the reserves are better applied after harvest (cfr before). In autumn, after the harvest, there is still enough metabolic activity to do foliar treatments. The leaves of the fruit trees maintain a photosynthetic activity and a breathing capacity quite some time after the moment of harvest. Not the stomata's, nor the chlorophyll concentration of the leaf limit the photosynthetic capacity of the leaves during this period.

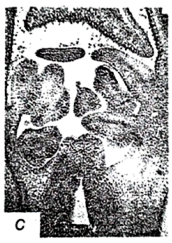
During the Winter months the fruit trees are not completely inactive either. Some important activity has been observed in the flower buds. In the yellow box below you can find some indications of how much the flower buds grow during these winter months. Furthermore, we have to keep in mind that on the majority of the fruit trees, the leaves appear in the spring after or at the same time that the plant is in full bloom. The capacity and possibility to apply nutrients before the blooming of these trees is therefore very small or almost inexistent. In case of deficiencies of the involved elements, even mild, interventions at this moment will always come too late and it will not be possible to avoid the negative effects of the deficiency.

The incorporation of some nitrogen (for example in the form of amino acids) in the post-harvest treatments stimulate even more the metabolism and the photosynthesis, promoting the production of carbohydrates (sugars that plants maintain as reserves in the wood during winter, for the consumption of energy during this period and at the beginning of the next cycle, when photosynthesis is still limited or in existing).





The beginning of the winter



Middle of February

Beginning of the breaking of the buds

Flower Buds

The growth of the flower buds during the winter period:

October - December:	+ 23-36 %
December - Mid-February:	+ 16-17 %
Mid-February - Mid-March:	+111-138 %

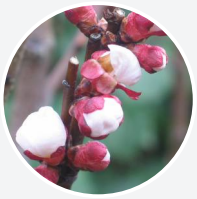
Total Growth: + 200-279%

Treatments

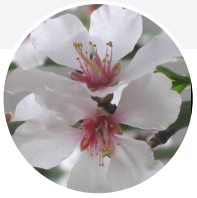
We recommend 2 - 3 applications of 2-3 L Hyberol/ha.

(the combination with Kappa V, a nitrogen rich product could be interesting to apply even more N).

The first treatment just after the harvest, and then the treatment is preferably repeated after 7 days. Although the ideal moment for the application of Hyberol is in post-harvest in autumn, it is possible to apply alternatively Hyberol in the spring in crops which have sufficient leaf formation before blooming, as for example, grapes, olives, citrus, avocados, ...



The photosynthetic activity of the trees in autumn is very important in order to obtain the best result of the Hyberol applications. Any deficiency that the plant might have, be it iron or other, will reduce this activity and will limit the effects of the treatments. In order to assure a well-balanced nutritional condition of the orchard we recommend to follow our nutritional programs adapted to the different fruit species.



Properties:

BIO APPROVED

In the product Hyberol all the different Nutrients necessary to replenish the plant reserves of fruit trees or perennials are brought together. The product contains Zinc (35 g/L), Boron (22 gr/L), seaweed extracts (which provide a certain amount of sugars and nitrogen in the form of amino acids) and some supplementary poliols (reduced sugars). As in all other products of BMS Micro-Nutrients, also in Hyberol the micro-nutrients are present in the chelated form in order to assure a good absorption and translocation. For a product like Hyberol it is especially important because the time between the post-harvest applications and the winter rest is limited and the fast translocation of the applied elements towards the reserve organs is of crucial importance.

The boron is normally an element with restricted mobility within the plants, but Hyberol applies this element in the chelated form (chelated with poliol) making the product systemic with also a good foliar absortion, good mobility within the plant and with a fast translocation to the reserve organs of the plant.

The post-harvest treatments in autumn with Hyberol will assure that the buds and flowers have no shortage of B and Zn, and they will also have sufficient energy supplies for good growth during the first weeks. Early treatments in spring can be avoided this way.

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