The thinning opportunities offered by Brevis®

Brevis® was registered in Italy in 2014 as a new thinning product for use in apple growing. The product was tested by the Laimburg Research Centre in South Tyrol between 2007 and 2014 in a large number of trials with Golden Delicious, Gala, Fuji, Red Delicious Spur, Pinova, Cripps Pink and Braeburn at various locations, varying between 230 and 900 metres above sea level. Brevis showed its efficacy in these trials.

Fruit growers in South Tyrol have a wide range of thinning products available that, under normal circumstances, achieve the desired thinning effect. However, when used in unfavourable weather conditions including wind, low air humidity and low temperatures or on less vigorous trees, the efficacy of the commonly used thinning products is sometimes disappointing. In this respect, Brevis (active ingredient metamitron) is a welcome addition to the available products.

The thinning effect

Brevis thins because it inhibits photosynthesis and therefore reinforces the natural fruit drop. Just a few hours after treating the leaves, the product reduces their ability to photosynthesize by up to 50% depending on the dose. This is the case for every leaf that is fully developed at the moment of spraying. The maximum level of photosynthesis returns after approximately 40 days. This period corresponds to the period that the

This is not an unusual image; heavy Gala fruit set. VZ Laimburg Research Centre
active ingredient metamitron is present in the tree. Apparently, the inhibition of photosynthesis corresponds to the presence of the product in the tree. Here it must be noted that the photosynthesis of the leaves that develop after the treatment is not inhibited and Brevis does not have any influence on vegetative growth. In any case, metamitron is a highly effective product. When the maximum dose (2.2 kg/ha) is used, the thinning effect is almost twice as strong as that of other thinning products. In addition, efficacy can be controlled via the dose. The efficacy increases proportionally with the volume of active ingredient used.

**The optimum spraying moment**

The trials could not unequivocally identify the optimum moment to spray. However, it appears to be when the average fruit size of the main fruit in the clusters is approximately 10-12 mm. Moreover, the weather conditions at the moment of spraying and in the days after influence the efficacy of Brevis. Temperatures around 20°C in combination with high relative air humidity and the least possible wind, promote the uptake of the product. The amount of photosynthetic active radiation after spraying indirectly influences the thinning effect of Brevis. The effect of Brevis increases if the level of hydrocarbons in the plant is low, for instance, due to reduced radiation (overcast weather, anti-hail nets, etc.), but also due to high night temperatures (assimilates produced during the day are consumed during respiration at night). For these reasons it must be assumed that the same concentration of Brevis applied to low-altitude orchards (for instance, 200 m above sea level) will be clearly more effective than when applied in higher-altitude regions (e.g. 900 m above sea level).

**Difficult to thin varieties**

The new thinning product is, in particular for difficult to thin varieties including Fuji, Red Delicious Spur and Gala in high-altitude fruit-growing regions, an interesting addition, and thins in particular Red Delicious Spur better than the products used up to now. However, for relatively easy to thin varieties including Golden Delicious, Cripps Pink or Pinova, dependent on the situation (old trees, orchards in the shadow of the mountains), Brevis can thin too strongly, even at a limited dose of 1.65 kg/ha. The product can even thin away all of the fruits in the lower part of old, large trees that are in lots of shadow. In such cases, the fruit grower should not use the bottom two or three sprayer nozzles to achieve even thinning over the entire tree. Moreover, when mixed with NAA or BA, Brevis reinforces the thinning effect. This combination is only recommended for use in very difficult thinning conditions.

**Other influences**

The product only causes limited damage in the form of fruit russetting and the susceptibility of the leaves to this product is limited. Golden Delicious however is extremely sensitive to Brevis. Under certain circumstances, the chlorophyll between the veins of the leaves of this variety can slightly discolor. In severe cases, the leaf edges can even necrotize. When Brevis is used in accordance with the instructions on the label, the fruits remain more or less undamaged.

An important aspect to take into account is the effect of Brevis on flower bud formation. The thinning trials show that, in particular when high doses are used, account must be taken of weaker flowering the following year. For this reason, before using Brevis to thin the fruits, one of the commonly employed products should be used to thin during flowering.

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**European Fruit Research Institutes Network (EUFRIN)**

In recent years, thinning research within the European working group of researchers in EUFRIN mainly focused on Brevis (metamitron). The product inhibits the photosynthesis of the trees. As a result of a shortage of sugars, the weakest young fruits drop from the tree. After a number of years of successful thinning trials using this product on apples and pears in a large number of countries, Brevis has now been registered as a thinning product in Serbia, Italy, Belgium, France, Israel, Greece, Spain and Switzerland. From 2016, registration is expected for the Netherlands, Germany, Austria, Great Britain, Poland and Portugal. Although the thinning effect of Brevis is clearly less temperature dependent than that of 6-BA and showed good thinning results even in Norway, the efficacy of this product is still also influenced by the weather. The current research therefore focuses on unravelling the influence of the amount of sunlight prior to and immediately after Brevis is applied. In addition, the research also addresses the influence of the night temperature, which has a major influence on the amount of assimilates consumed by the plant during respiration, on the efficacy of Brevis. The objective is to develop a model that can predict the thinning effect of Brevis based on the weather conditions at the time. This model must become a tool that consultants and growers can use to choose the correct dose and time to spray this new thinning product on apples and pears.  

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