



Proceedings of the 16th International Pepper Conference Tampico, Tamaulipas, Mexico. November 10 – 12, 2002

PREVENTION OF CA-DEFICIENCY IN PEPPER (*CAPSICUM ANNUUM* L.) USING MAGNUM- P44[®] THROUGH DRIP IRRIGATION

Authors:.. Ludwig Pülschen and Majed Samawi, Kemira Oyj

Summary

Use of drip irrigation and more so of fertigation increases rapidly in many arid regions of the world. This is mainly due to various potential benefits such as fertilizer, water and labour savings, more precise management options such as controlled salinity, fewer weed problems, etc.

While nutrients such as N and K are easily applied through drip systems, P is more difficult to apply when focusing on proper distribution in the rooting zone. Acidic P-fertilizers such as Magnum-P44[®] offer various advantages, e.g. by increasing the amounts of plant available macro- and micronutrients, particularly under prevalence of alkaline soils and hard water (rich in bicarbonates) and by reducing the risks of precipitate formation, e.g. Ca- and Mg-phosphates, which are unavailable to plants and which may clog dripping systems. On the other hand calcium-deficiency-related disorders are widespread, e.g. in fast-growing and low-transpiring organs, and this may lead to low yields of marketable fruits: blossom end rot in tomato or watermelon, bitter pit in apple, tipburn in lettuce and blackheart in celery are common paraphrases for the symptoms of this economically very important disorder.

In Alyadwdh, Jordan, a site with heavy-textured, alkaline and calcareous soil conditions (pH 7.6, CaCO₃: 4.95 %), a replicated trial with 10 pepper varieties (*Capsicum annuum* L.) differing in their susceptibility to Ca-deficiency were grown under plastic houses in the 2002 summer season. From early fruiting stage onwards two fertigation programmes (treatments I and II) were established, in order to evaluate their potential to eliminate this common nutrient deficiency. These treatments mainly differed with regard to the choice of the P-fertilizer: In the treatment (I) using Magnum- P44[®] as a P-source, no calcium and magnesium was applied, whereas the programme (II) using a compound fertilizer product, Ca-and Mg-nitrate was added. Both fertigation programmes used similar amounts of N, P, K. Fertigation was done twice a week. Classification of the degree in Ca-deficiency was done by a visual scoring (0-10) in three different growth stages of the crop. While most of the varieties of treatment (II) received high scores for Ca-deficiency (medium to severe deficiency symptoms) even with frequent fertilizer applications through the drip system, 50 % of the varieties under treatment (I) fully and 20 % slightly had recovered from medium to severe Ca-deficiency stress approx. 3 weeks after the start of the fertigation programme. This was underlined scores for Ca-deficiency which were significantly lower compared to the scores reached in treatment (II). The trend of decreasing Ca-deficiency scores in treatment (I) continued during the trial period. The results are discussed in view of proper choice of P-fertilizers under alkaline soil conditions with special emphasis on benefits of using Magnum- P44[®]