

## Main elements

**Nitrogen** is the element that is absorbed the most and the easiest by the plant. A peony needs a lot of nitrogen during strong growth, like in the first weeks with vegetative growth (length growth). There are two types of nitrogen in your soil: ammonium nitrogen and nitrate nitrogen. Ideally we see equal amounts of each (a 1:1 ratio). Multiple problems can occur when there is a shortage of nitrogen. The older foliage might turn yellow to light green. The plants might flower too early, have less length growth and are more sensitive to fungal diseases and insects.

Too many nitrogen is not good for the Ca/Mg absorption.

**Phosphate** has a good effect on the formation of the main root system. This element takes care – in association with kali – of bigger and fuller flowers too. That is why we advise to give extra phosphate and kali before the blooming starts. A lack of phosphate will result in smaller foliage and less bright flowers. It is also possible that the foliage will colour red/purple (at low temperatures deficiency symptoms can occur).

An excess of phosphate does not occur very often, because phosphate binds easily to the soil particles. But an excess can result in a shortage of magnesium, because in that case the plant cannot absorb the magnesium anymore.

**Potassium** takes care of the firmness of the stems and the foliage. In association with phosphate it makes the flower buds bigger. When there is enough potassium the plant can protect itself better against bacteria and fungi. With a lack of potassium the edges of the leaves will turn yellow, starting with the older leaves at the bottom. The foliage turns smaller and the stems thinner. Too many kali causes salt damage and a bad plant growth.

**Magnesium** gives the plant a healthy and fresh green appearance. It also increases the strength of the cell walls and the firmness of the tissue. It is a building block for various enzymes too. When there is a lack of magnesium the leaves turn yellow while the leaf veins will stay green. There is almost no excess possible. Deficiency symptoms can occur at drought, lower temperatures and a lower pH value.

**Calcium** is used by the plant for its firmness and to build-up cells. This element is very important for the water balance of the plant and is indispensable at high temperatures. The plant will evaporate a lot at high temperatures and it has to take in more water than usual. A shortage of

calcium arises when the growth is too fast en the humidity too high. In this circumstances the plant evaporates barely or not at all. If a plant cannot evaporate, it will also not take in any water or nutrition. When there is a lack of calcium the young foliage will die and the plant will be more sensitive to fungal diseases. The absorption of calcium will be limited with a phosphate-rich and calcareous soil.

**Trace elements** do not get enough attention in cultivation. They are the vitamins and minerals for the plant. The trace elements will be absorbed less well when the pH level is higher than 6.5. Trace elements are: Fe = Iron, Mn = Manganese, B = Borium, Zn = Zinc, Cu = Copper and Mo = Molybdenum. All these elements have an important function. They are the building blocks of the plant. Trace elements take care of the water balance, cell division and metabolism of the plant. The trace elements are absorbed by the plant through its roots so it is important to have enough of them. There are almost no trace elements in the nutrition that we buy. It is important to give extra during every feeding.

The results of a shortage of a specific micro element are as follows:

**Fe = iron:** young leaves will turn light green, yellow or white between the nerves. Absorption problems at low temperatures, too wet or dry soil and a high pH value.

**Mn = manganese:** older leaves will turn yellow between the nerves. Absorption problems at low temperatures, too wet or dry soil and a high pH value.

**B = boron:** helps with the absorption of silicon. Boron improves, amongst other things, the number of flowers. Boron is, together with Calcium and Silicon, required at the start of the cultivation. Deficiency symptoms are growth problems and malformation of the foliage.

**Zn = zinc:** growth problems and unwanted spots on the foliage.

**Cu = copper:** dying flower buds, young leaves will curl and turn yellow or grey.

**Mo = molybdenum:** almost always too low on the SoilBalanceAnalysis. Important for the conversion of nitrogen in the air to ammonium nitrogen by enzymes. Deficiency symptoms in older leaves: yellowing due to the failure of properly convert nitrogen. Deficiency symptoms in young leaves: deformation and yellowing of the leaves.