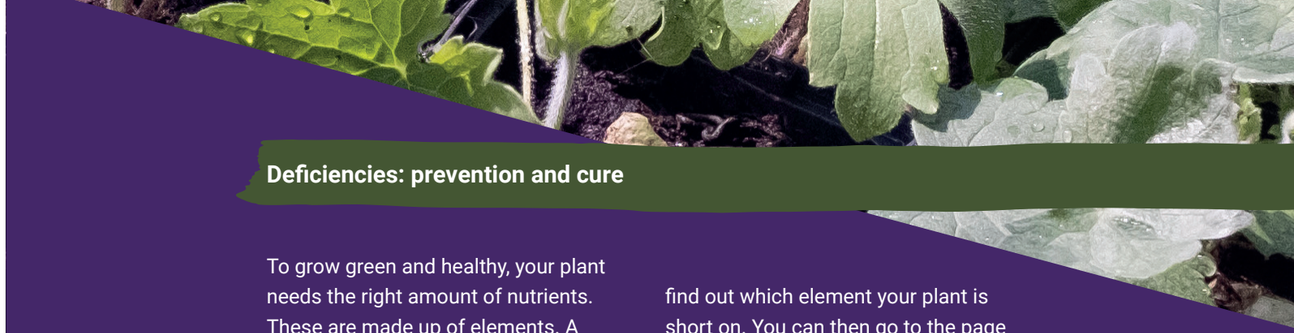
PLAGRON

Deficiencies: prevention and cure

Content



Deficiencies: prevention and cure

To grow green and healthy, your plant needs the right amount of nutrients. These are made up of elements. A shortage of an element leads to symptoms of deficiency in your plant. This guide is meant to help you in case you suspect a shortage. The flowchart on the next page shows you which symptoms occur for each deficiency. Under normal circumstances, the first symptom mentioned is also the first symptom visible. Use the flowchart to find out which element your plant is short on. You can then go to the page for this specific element. Here you can read how to recognise the deficiency and what might have caused it. Of course, we'll also tell you how to prevent and cure the shortage.

Other causes

The flowchart gives you a good indication of the deficiency your plant is suffering from. However, in some cases your plant may instead be suffering from a shortage of a different element. Keep in mind that deficiencies may also be caused by external factors. For instance, the pH value of your soil or substrate may be too high (>7.0) or too low (<5.0). Things like humidity, temperature and the amount of water and nutrients your plants receive can also cause deficiencies. As such, giving your plant more of the element it is lacking is not always the correct solution.

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Nutritional deficiencies in plants

Visible in the young leaves.

Leaf becomes yellow and wilts, but does not wither.

COPPER
1 Wilted leaves.
2 Blue glow at the edges of leaves.
3 Leaves seem limp.
4 Reduction of growth and bloom.
p. 20

ZINC
1 Yellowing between the veins.
2 Leaf appears thick.
3 Short petioles.
4 Withered leaf tips.
p. 26

Leaf becomes yellow, but does not wilt.

IRON
1 Yellowing between the veins.
2 Growth stagnation.
p. 16

SULPHUR
1 Yellow leaves.
2 Veins become yellow.
3 Withered leaf tips.
p. 28

Leaf looks deformed and withers in random spots.

CALCIUM
1 Brown spots; leaf remains green.
2 Leaf may become deformed.
p. 12

MANGANESE
1 Yellow leaves.
2 Veins remain green.
3 Small withered spots.
p. 24

BORON
1 Deformed leaves.
2 Burned leaf tips.
3 Brown spots on the leaf.
4 Yellow, thick leaves.
p. 22

Visible in the old leaves.

Damage starts in the old leaves, but is visible in the entire plant.

NITROGEN
1 Light green leaf colour.
2 Yellow leaves.
3 Reduced growth.
p. 6

MOLYBDENUM
1 Light green leaf colour.
2 Withered spots.
3 Hanging leaves.
p. 18

PHOSPHORUS
1 Red or purple discolouring.
2 Growth stagnation.
3 Plant seems limp.
p. 8

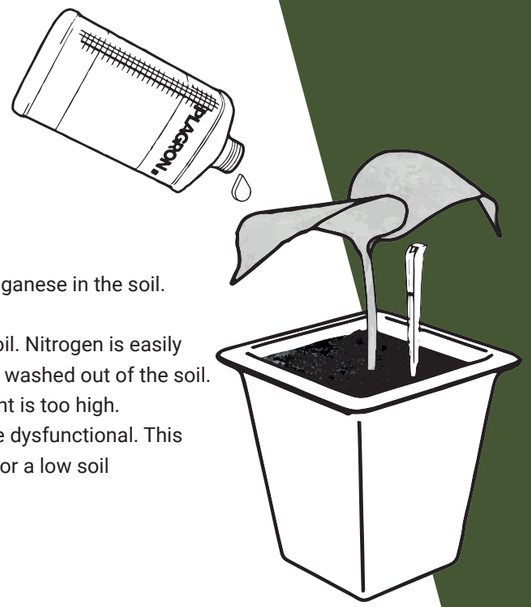
Damage on the leaves. Spots and deformation visible.

POTASSIUM
1 Yellow spotted leaves.
2 Withered leaf edges.
3 Leaf edges become grey in colour.
p. 10

MAGNESIUM
1 Yellowing of the veins.
2 Withered spots on the leaves.
3 Withered leaf tips.
p. 14

Nitrogen deficiency

A nitrogen deficiency can be recognised by yellow leaves. This is because chlorophyll disappears from the leaves. You'll first see this happen in the older leaves at the bottom of the plant. This happens because plants transport the available nitrogen to their young leaves and growing points. Eventually the growth of plants will stop as a result, and leaves will fall off. Some plants may see the leaves turn purple instead of yellow. Among others, this happens in multiple varieties of cabbage. A plant with a nitrogen deficiency will remain smaller than a healthy plant. The same goes for its fruits. Plants with a nitrogen deficiency are also more susceptible to problems like diseases and insects.



CAUSE

How do you recognise a nitrogen deficiency?

- First, the older leaves turn yellow-green. This colouring will spread from the inside of the leaves to the outside.
- Next, the yellowing will spread to the base of the leaf and the veins.
- Eventually, the growth of the plants stops and the leaves fall off.
- The stems of your plants will turn purple or reddish.

What is the (possible) cause?

- Too much potassium, zinc and manganese in the soil.
- Too much chloride in the soil.
- Too little nitrogen available in the soil. Nitrogen is easily soluble. This means it can easily be washed out of the soil.
- The pH value of the root environment is too high.
- The root system of the plant may be dysfunctional. This can be caused by damage, disease or a low soil temperature.

EFFECT

How can you prevent it?

Under normal circumstances a nitrogen deficiency does not occur quickly. However, during intense stress or a growth spurt the plant is more susceptible to deficiencies. By using one of our basic nutrients (like Alga Grow and Alga Bloom), you reduce the likelihood of a deficiency. Also keep abiotic factors in mind. These include temperature, light intensity, acidity, amount of moisture and wind strength.

How can you cure it?

Are the leaves yellowed? Then fertilise your plants with a fertiliser with a high nitrogen content like Terra Grow. We also call this a fertiliser with a high N value. These can be applied as foliar fertiliser.

What does nitrogen do for the plant?

Nitrogen is an essential nutrient for your plant. It is required for the creation of chlorophyll. In turn, chlorophyll is needed for photosynthesis. A plant uses photosynthesis to grow. Additionally, nitrogen is part of the amino acids. These are used to form proteins. Proteins are needed for every conceivable process in the plant. For instance, they stimulate growth and promote fruit development.

Phosphorus deficiency

The first sign of a phosphorus deficiency is a sudden growth stagnation. If the deficiency continues, a dark discolouration occurs at the older leaves. These leaves can be found at the bottom of the plant. Some plant varieties may show pale yellow or dark-blue green old leaves instead. This is due to the accumulation of carbohydrates. These plant varieties will also end up with veins that are purple at the bottom. Additionally, you can recognise a lack of phosphorus underground: root development will decrease.

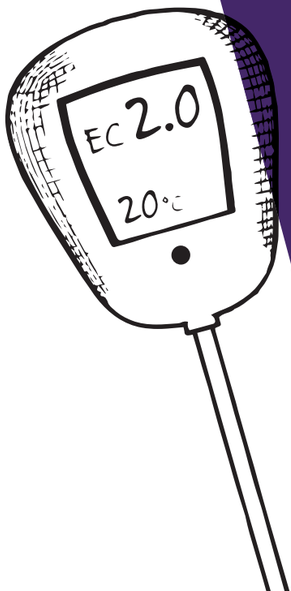
CAUSE

How do you recognise a phosphorus deficiency?

- At first, a phosphorus deficiency will lead to a sudden growth stagnation.
- Next, you'll notice a dark green discolouration of the lower, older leaves. Red or purple colours may also appear.
- Root development will decrease.
- Leaf extension is reduced.
- Leaf surface and the amount of leaves are reduced.
- Shoot growth will decrease. Stalks become short and slender.
- The quality of the yield is reduced.

What is the (possible) cause?

- Low phosphorus concentration in the soil.
- The substrate is too wet.
- The pH value of the soil is too low.
- The temperature in the soil is too low.
- A lack of oxygen in the soil can reduce the absorption of phosphorus.



EFFECT

How can you prevent it?

Prevention is better than cure. Therefore, choose a phosphorus rich potting soil to allow your plant to grow. The soil temperature is also important: keep this around 21°C. Use one of our basic nutrients (like Terra Grow and Terra Bloom) to reduce the likelihood of a deficiency. Also keep abiotic factors in mind. These include temperature, light intensity, acidity, amount of moisture and wind strength.

How can you cure it?

A fertiliser that contains a lot of phosphorus can help eliminate the deficiency. Bat manure like our Bat Guano is an excellent choice for this. You can also use a liquid fertiliser like Green Sensation or PK 13-14. Another option is to flush your grow system with clean, pH-controlled water. This lowers the pH and EC values.

What does phosphorus do for the plant?

Phosphorus is a macro nutrient. This means that plants need it in large quantities to grow and thrive. Additionally, phosphorus plays a central role in the photosynthetic process and in the breathing of the plant. These two processes ensure that the plant has enough energy. Fast-growing plants use large amounts of phosphorus to produce flowers and fruits during the flowering phase.

Potassium deficiency

Plants suffering from a lack of potassium are smaller and have a short, limp stem. In addition, you can recognise the deficiency by smaller flower tops and pale fruits. Leaves can turn yellow or die off. This starts at the edges. There may also be brown or burned spots visible. A potassium deficiency is initially visible at the older, lower leaves. This is because potassium is a mobile element. The young leaves draw the potassium from the older leaves. Potassium deficiency results in a low yield of poor quality.

CAUSE

How do you recognise a potassium deficiency?

- Plants are smaller and have a limp stem.
- Smaller flower tops and pale fruits.
- Leaves may have brown spots, brown veins, yellow edges or yellowing veins.
- Plants with a potassium deficiency can absorb less water.
- Reduced yield that is also of poor quality.

What is the (possible) cause?

- Too little potassium in the soil or in the substrate.
- Too much calcium or magnesium content in the soil.
- Incorrect fertilisation.
- Too much sodium in the soil.

EFFECT

How can you prevent it?

To prevent a potassium deficiency, you can use our Bat Guano. This bat manure is very rich in potassium. Use one of our basic nutrients (like Cocos A&B) to reduce the likelihood of a deficiency. Also keep abiotic factors in mind. These include temperature, light intensity, acidity, amount of moisture and wind strength.

How can you cure it?

To stop a potassium deficiency, you can use a liquid fertiliser with a high potassium content. Examples include Green Sensation and PK 13-14.

What does potassium do for the plant?

Potassium improves the resistance of the plant and helps strengthen the cell wall. It regulates the opening and closing of stomata. These are used to absorb carbon dioxide, water vapor and oxygen. Proper functioning of the stomata is essential to the plant. It uses them for cooling, photosynthesis and transporting nutrients.

Calcium deficiency

A calcium deficiency leads to various growth disorders, like deformed buds and leaves. The tips of the leaves will curl up. Brown spots will also be visible on the leaves. The deficiency starts in the new leaves, but its symptoms will first show on the middle leaves. Plants with a calcium deficiency will remain smaller and have a poor fruit quality. The yield is usually lower.

CAUSE

How do you recognise a calcium deficiency?

- You will see brown spots, starting at the new leaves.
- The tips of older leaves will curl up.
- The yield will be less and of poorer quality.
- The leaves will go dark green.
- The stem will be weaker.
- Your plants will start flowering early.

What is the (possible) cause?

- The pH value of the soil is too low.
- The EC value of the soil is too high.
- The levels of potassium or magnesium in the soil are too high.
- Too little or incorrect fertilisation.
- Salt stress.
- Drought stress.

EFFECT

How can you prevent it?

Prevention is better than cure. Therefore, choose a calcium rich potting soil to allow your plant to grow. Use one of our basic nutrients (like Hydro A&B) to reduce the likelihood of a deficiency. Also keep abiotic factors in mind. These include temperature, light intensity, acidity, amount of moisture and wind strength.

How can you cure it?

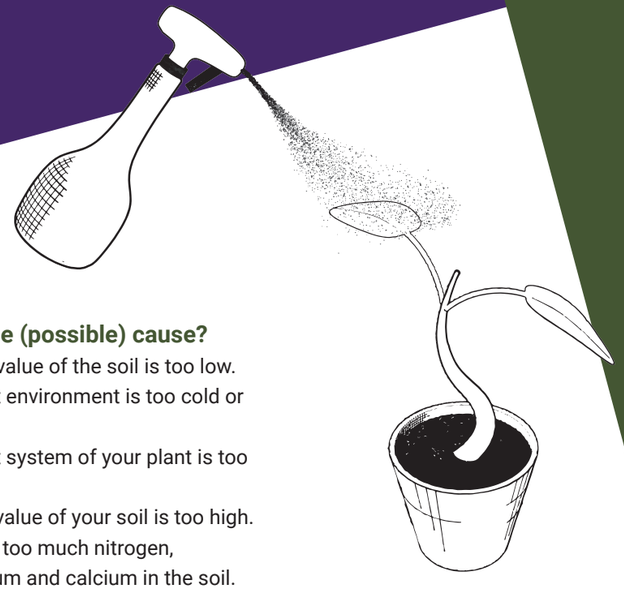
Is your EC value too high? Then we recommend rinsing the soil or substrate with clean water. The same applies to the pH value. You can also increase the pH value of your soil with Calcium Kick. Calcium and other nutrients are then absorbed optimally. However, make sure you do not add too much. When there is an excess of calcium, your plants may experience a potassium, magnesium, iron or manganese deficiency.

What does calcium do for the plant?

Calcium plays a role in cell division, making it essential for plant growth. Together with pectin, it also helps construct and strengthen cell walls. Calcium also plays a part in the development and functioning or the root system and in the metabolic process.

Magnesium deficiency

A magnesium deficiency first becomes visible at the oldest leaves. Here small rust coloured or cloudy yellow spots will appear. Dead spots may also occur and leaf tips will curl up. As the spots spread, the leaves will turn more yellow. This causes the plant to look more and more tattered. In this stage you'll also see colouring of the young leaves and a decrease in fruit production.



CAUSE

How do you recognise a magnesium deficiency?

- Yellow-green to yellow discolouring between the veins.
- Yellowing and brown spots on older leaves.
- The plant will create less fruits and flowers.
- The stems of leaves will turn purple.
- The tips of the leaves curl up.

What is the (possible) cause?

- The pH value of the soil is too low.
- The root environment is too cold or too wet.
- The root system of your plant is too small.
- The EC value of your soil is too high.
- There is too much nitrogen, potassium and calcium in the soil.

EFFECT

How can you prevent it?

Choose a magnesium rich potting soil for your plant to grow in. You can mix a handful of magnesium granules through the soil to achieve this. The soil temperature is also important: keep this around 22°C. Use one of our basic nutrients (like Alga Grow and Alga Bloom) to reduce the likelihood of a deficiency. Also keep abiotic factors in mind. These include temperature, light intensity, acidity, amount of moisture and wind strength.

How can you cure it?

The best way to cure a magnesium deficiency is to simply give more magnesium. Don't give this directly through the soil however, as this may cause a calcium deficiency in your plant. Instead, spray foliar feed in which 2% bitter salt has been dissolved on your plant. Do you think the problem is caused by an incorrect EC or pH value? Then we advise flushing your system with clean, pH-controlled water.

What does magnesium do for the plant?

Magnesium is very important for photosynthesis of the plant, since it is a building block of chlorophyll. This means it helps your plant grow. Many enzymes also require magnesium to fulfil their function.

Iron deficiency

An iron deficiency is first visible at the top of the plant. Young leaves look as if they have been bleached. The leaves turn yellow, while the veins remain green. This is because iron is an immobile element. What this means is that iron, when fixated, can no longer be distributed in the plant. Eventually, yellowing also occurs in the older leaves and smaller veins. In severe cases, the leaves may even die off.

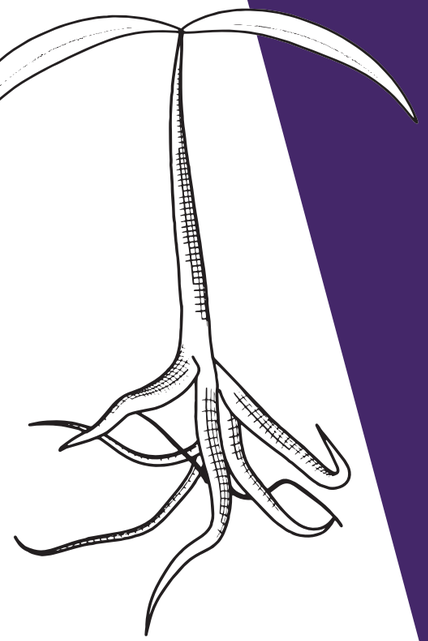
CAUSE

How do you recognise an iron deficiency?

- At first, you'll see bleaching between the veins in young leaves. The veins themselves remain green.
- Next, larger leaves will also turn yellow and the growth will slow down.
- In severe cases leaves may die off.

What is the (possible) cause?

- Too little iron available in the soil.
- The pH value of the soil is too high.
- Too much zinc or manganese in the soil.
- Too much light on the nutrient tank. This can cause algae to grow in your nutrient solution.
- The substrate is too wet. This stagnates the oxygen supply.
- The root of your plant system functions poorly. This can be due to diseases, damage or low temperature.



EFFECT

How can you prevent it?

Always make sure your plants can absorb enough iron. Therefore, ensure the soil has been drained properly. Symptoms of iron deficiency are most common on soils that contain a lot of calcium and have a pH value that is too high. Use one of our basic nutrients (like Terra Grow and Terra Bloom) to reduce the likelihood of an iron deficiency. Also keep abiotic factors in mind. These include temperature, light intensity, acidity, amount of moisture and wind strength.

How can you cure it?

To prevent an iron deficiency, you can use Vita Race. This is an iron spray for the growth phase and the first three weeks of the flowering phase. Other options are increasing the soil temperature and improving drainage. Is the EC or pH value too high? Then rinse your system with clean, pH-controlled water.

What does iron do for the plant?

Iron is important for the growth and development of a plant. It is used by the plant for the formation of chlorophyll. In turn, chlorophyll plays an important role during photosynthesis. With photosynthesis, a plant creates sugars and provides itself with energy. Many enzymes also require iron to fulfil their function.

Molybdenum deficiency

A molybdenum deficiency initially resembles a nitrogen deficiency. The oldest leaves at the bottom will turn yellow and might get dark spots. A molybdenum deficiency is recognised by a unique purple, orange, red or pink colouring around the edges of the leaves. This colour may spread to the centre of the leaf.

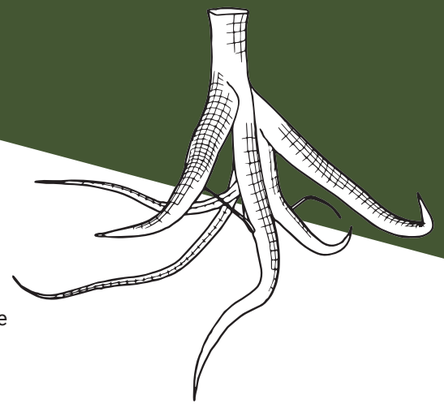
CAUSE

How do you recognise a molybdenum deficiency?

- Looks like a nitrogen deficiency at first.
- Yellowing and possible dark spots on the oldest, lowest leaves.
- Unique purple, orange, red or pink colouring at the edges of the leaves.
- Twisted young leaves.

What is the (possible) cause?

- The pH value of the soil is too low.
- There likely is enough molybdenum available in the soil, but the roots are unable to absorb it.



EFFECT

How can you prevent it?

You can prevent a molybdenum deficiency by making sure your plant and its roots are at their optimal pH-value. Molybdenum is best absorbed when the pH-value is kept stable between 6.0 and 7.0. Use one of our basic nutrients (like Cocos A&B) to reduce the likelihood of a molybdenum deficiency. Also keep abiotic factors in mind. These include temperature, light intensity, acidity, amount of moisture and wind strength.

How can you cure it?

Always make sure your plants can absorb enough molybdenum. Therefore, ensure the soil has been drained properly. Symptoms of molybdenum deficiency are most common on acidic soils with a low pH value.

What does molybdenum do for the plant?

Molybdenum is a part of the enzyme that converts nitrate into protein nitrogen. It is a building block of several plant hormones.

Copper deficiency

You're dealing with a lack of copper when young leaves start to wither and dry out. This happens because copper is not mobile in the plant. The leaves curl down and hang limp. They will also get a faint blue glow. Stems, branches and twigs can be less strong and might break easier. A plant with copper deficiency will also grow slower than a healthy one.

CAUSE

How do you recognise a copper deficiency?

- Wilting and desiccation of younger leaves.
- Leaves curl down and get a faint blue glow.
- Stems, branches and twigs are less strong.
- Small leaves with brown spots.
- Tip burns on the leaves.
- Delayed growth.
- Young leaves turn dark green and will twist.

What is the (possible) cause?

- Low copper levels in the soil.
- The pH value of the soil is too high.
- Too much iron, aluminium, manganese or calcium in the soil.
- The root of your plant system functions poorly. This can be due to diseases, damage or low temperature.

EFFECT

How can you prevent it?

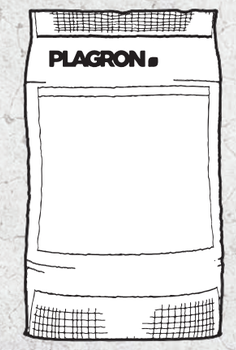
Prevention is better than cure. Choose a copper rich potting soil for your plant to grow in. Use one of our basic nutrients (like Hydro A&B) to reduce the likelihood of a deficiency. Also keep abiotic factors in mind. These include temperature, light intensity, acidity, amount of moisture and wind strength.

How can you cure it?

You can add extra copper by fertilising. If you think a high pH value is the cause, we recommend rinsing your system with clean, pH-controlled water. Results will be visible within a few days. Older leaves might not recover and are best removed.

What does copper do for the plant?

Copper increases the resistance of the plant. It plays a role in enzyme reactions that are important for photosynthesis. In addition, copper ensures the formation of lignin. Lignin makes the cell wall waterproof, sturdy and better protected against bacteria and fungi.



Boron deficiency

A boron deficiency is recognisable by discolouration of the younger leaves. You'll also see a rust-coloured deposit on the crop. New leaves seem to have their ends burned. A lack of boron also renders the crop fragile. Roots are also vulnerable to boron deficiency: their growth will lag behind.

CAUSE

How do you recognise a boron deficiency?

- Rusty deposits on the younger leaves.
- New leaves seem burned, thick and brittle.
- The crop will be fragile.
- Brown spots on the crop.
- Twisted leaves.

What is the (possible) cause?

- The soil has been in use for too long.
- The pH value of the soil is too high.
- The root environment is too dry.
- Incorrect nutrition.
- Boron is easily soluble. This means it can easily be washed out of the soil.

EFFECT

How can you prevent it?

Boron deficiencies are rare. Under normal circumstances plants will not suffer from it. However, during intense stress or a growth spurt the plant is more susceptible to deficiencies. Use one of our basic nutrients (like Alga Grow and Alga Bloom) to reduce the likelihood of a deficiency. Also keep abiotic factors in mind. These include temperature, light intensity, acidity, amount of moisture and wind strength.

How can you cure it?

Make sure the moisture level of your soil is in order. Lowering the pH value can also be a solution. To do so, rinse your system with clean, pH-controlled water. Older, damaged leaves may not recover.

What does boron do for the plant?

Boron is important for cell stretching and cell division. It plays a role in the water management of the plant and the transport of carbohydrates. Additionally, it stimulates the flowering. It also helps with the production of sugars.

Manganese deficiency

A manganese deficiency closely resembles an iron deficiency. The difference is that manganese deficiency is mainly visible in leaves just below the top of the plant. Additionally, young leaves will get a light leaf colour followed by dark, brown spots. Another difference from an iron deficiency is that the edges of the leaves will remain green. A manganese deficiency also stalls the photosynthetic process of the plant, causing it to grow slower.

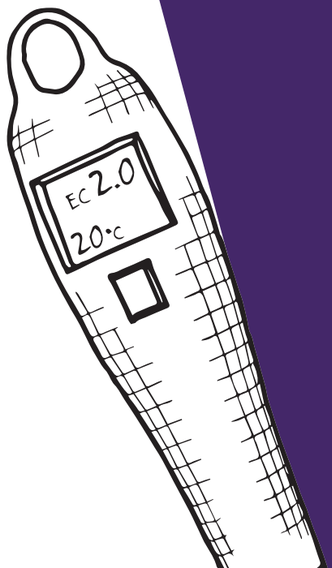
CAUSE

How do you recognise a manganese deficiency?

- Looks like an iron deficiency.
- Discolouration of young leaves just below the top.
- Dark spots on the leaf, while the edges remain green.
- Yellowing between the veins of the leaf.

What is the (possible) cause?

- The pH level of the soil is too high.
- Incorrect fertilisation.
- Disruption of the root environment.
- Too much iron in your soil.



EFFECT

How can you prevent it?

Prevention is better than cure. Use one of our basic nutrients (like Terra Grow and Terra Bloom) to reduce the likelihood of a deficiency. Also keep abiotic factors in mind. These include temperature, light intensity, acidity, amount of moisture and wind strength.

How can you cure it?

If you think your plant has a manganese deficiency, it is wise to flush your system with clean, pH-controlled water. This ensures a good pH and EC value. The symptoms will stop spreading within a week. Keep in mind that damaged leaves are unlikely to recover.

What does manganese do for the plant?

Manganese is important for lignin, a substance that ensures that the cell walls are firm. In addition, it is part of enzymes that help with cell division, metabolism and photosynthesis. Manganese is also involved in the structure of chlorophyll granules.

Zinc deficiency

When there is a shortage of zinc, the younger leaves start to yellow between the veins. Leaves become discoloured and start to die. They can also have a unique striped pattern and the plant stops growing vertically. If the problem is not corrected in time, the plant might stop growing entirely or even die.

CAUSE

How do you recognise a zinc deficiency?

- Yellowing of the younger leaves.
- An unique striped pattern on leaves.
- Early release of older leaves.
- Shortened internodes. This is the vertical part of the stem in between two leaves.
- Dwarfing of leaves.
- Leaf tips will look burned.

What is the (possible) cause?

- The pH level of the soil is too high.
- The plant receives too much water.

EFFECT

How can you prevent it?

Keep in mind that zinc is best absorbed in an acidic root environment. Use one of our basic nutrients (like Cocos A&B) to reduce the likelihood of a zinc deficiency. Also keep abiotic factors in mind. These include temperature, light intensity, acidity, amount of moisture and wind strength. A zinc shortage can also be caused by stressful circumstances. If this is the case, the symptoms may disappear automatically when the period of stress is over.

How can you cure it?

Do you suspect that your plant has a zinc deficiency due to a high pH value? Then you can rinse your system with clean, pH-controlled water. If you use quality soil and the right nutrients, you do not need to add extra zinc to the soil. Damaged leaves will not fully recover. The deficiency has been remedied when new leaves do not show symptoms.

What does zinc do for the plant?

Zinc increases the resistance of the plant. In addition, it is an important element of the naturally occurring growth hormone auxin. Zinc is used for the stretch of the stem and veins. It also ensures the development and proper functioning of chlorophyll, which helps your plant grow. Many enzymes also require zinc to fulfil their function.

Sulphur deficiency

Sulphur deficiency resembles nitrogen deficiency, but at the top of the plant. Because sulphur is not mobile, the deficiency is first observed in the younger leaves. These turn pale green, while the petioles get a strong purple tint. The leaf tips can curl up. If several leaves start to fade, the colour changes from light green to deep yellow. In case of a serious deficiency, flowering and growth are inhibited. A lack of sulphur can lead to a lower yield and poor quality of the end product.

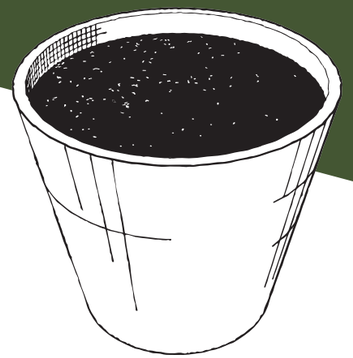
CAUSE

How do you recognise a sulphur deficiency?

- Greening of the younger leaves.
- Leaf stems get a purple tint.
- The veins will start yellowing.
- Leaf tips may curl up.
- In case of serious deficiency flowering and growth are inhibited.

What is the (possible) cause?

- The pH level of the soil is too high.
- Incorrect composition of nutrients.



EFFECT

How can you prevent it?

A sulphur deficiency only tends to occur when growing in potting soil. Even a small shortage can have a major influence on the yield of your crop. We recommend using one of our basic nutrients (like Hydro A&B) to reduce the likelihood of a deficiency. Also keep abiotic factors in mind. These include temperature, light intensity, acidity, amount of moisture and wind strength,

How can you cure it?

You can add extra sulphur by means of additional fertilisation. Another option is to lower the pH value of your soil or substrate. This can be done by rinsing your system with clean, pH-controlled water.

What does sulphur do for the plant?

Sulphur, along with nitrogen, is very important for the production of amino acids. These amino acids are used in proteins. As sulphate, sulphur is also important for the water balance of the plant. Additionally, sulphur is active in the structure and metabolism of the plant and accelerates the production of chlorophyll. These help your plant grow through photosynthesis.

Notes

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