

Deficiency Symptoms

Younger leaves (immobile nutrients)

Older leaves (mobile nutrients)

Terminal buds
ALIVE, but wilted

Terminal buds
are **DEAD/DYING**,
young leaves are
distorted

Mostly **GENERALIZED**
over entire plant.
Lower leaves dry
up, die

Mostly
LOCALIZED. Mottling
or chlorosis. Leaf
margins cupped or
tucked

Young
leaves
chlorotic, NOT
WILTED

Plants
light green
or
yellow

Copper (Cu)

- Wilted young leaves
- Leaf tips appear withered
- Weak stem tip

Zinc (Zn)

- Initial symptoms occur in MIDDLE leaves
- Short stalks (stunted growth)
- Small, thick leaves

Calcium (Ca)

- Hooked young leaves, then die back at tips/ margins
- Leaf cupping

Boron (B)

- Small, crinkled, deformed leaves
- Young leaves light green at base, die back from base

Phosphorus (P)

- Dark green foliage, with red/purple colour
- Plants stunted

Magnesium (Mg)

- Interveinal chlorosis
- Yellowing starting at leaf base

Potassium (K)

- Chlorotic areas with scorching along leaf margin
- Leaf cupping
- Slender stalks

Nitrogen (N)

- Light green foliage, NO necrotic spotting
- Slow growth, spindly plants

Molybdenum (Mo)

- Light green foliage
- Leaves may look scorched, cupped, rolled

Are there
NECROTIC
SPOTS?

YES

NO

Manganese (Mn)

- Veins remain green
- Small NECROTIC spots
- Yellowing, cupping, and/or spotting of leaves

Iron (Fe)

- Veins remain sharply green in contrast with chlorotic leaf

Sulfur (S)

- Light green foilage, similar to N deficiency except found in new growth

About Perennia

Perennia Food and Agriculture Inc. is a provincial development agency with the mission to support growth, transformation and economic development in Nova Scotia's agriculture, seafood, and food and beverage sectors.

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Nutrient Deficiency Guide

Glossary

Chlorotic = yellowing

Mottling = blotches

Necrotic = dead

Interveinal = between the veins

Information in this pamphlet provided by Perennia's Vegetable Specialist, Rosalie-Gillis Madden

Nutrient Deficiencies

1. Boron (B)

- Growth reduction/death at growing tip
- Small, crinkled, deformed leaves
- Short internodes
- Poor seed set or fruit set, hollow stem in Cole crops, internal browning of root crops, cracked stem in celery, catface in strawberries

3. Sulfur (S)

- Light green leaves
- Looks like N deficiency except found on new growth
- Plants are spindly and small, with thin stems
- Common on sandy, low organic matter soils

2. Calcium (Ca)

- Terminal buds turn brown, die back
- Irregular leaf margins, cupping
- Young leaves distorted, reduced in size
- Tip burn in lettuce and cabbage, black-heart in celery, forked roots in beets, cavity spot in carrots, blossom end rot in tomatoes, peppers, and watermelon

4. Iron (Fe)

- Veins very green, rest of leaf is chlorotic or white
- Stunted growth, usually no necrosis
- Often occurs when soil pH is high
- Highbush blueberry may get fruit that are small and not fully ripen

5. Zinc (Zn)

- Initial symptoms in middle leaves
- Small leaves, necrotic, short internodes
- Pig tailing in onions; leaf roll in potatoes; small, narrow leaves with black spots in yellow areas in tomatoes, zebra-stripping in corn

7. Copper (Cu)

- Chlorotic young leaves, withered tips
- Stunting
- Tip dieback in onions (on mineral soils), undersized onions

8. Manganese (Mn)

- Plant becomes yellow to olive green with stunted growth
- Yellowing, cupping, and/or spotting of leaves, some mottling in interveinal areas
- Most common if soil pH >6.8
- Marsh spot in peas and beans

9. Potassium (K)

- Tip and marginal leaf scorch, margins become brown and cup downward
- Chlorosis throughout leaf, premature leaf and fruit drop
- Slowed plant growth
- Reduced fruit size, shriveled seed, small tubers

11. Nitrogen (N)

- Slow growth, stunted, spindly plants
- Yellowing on older leaves
- Turning up of tips and margins of leaves
- Red calyx on strawberries

10. Magnesium (Mg)

- Interveinal chlorosis on lower leaves
- Low Mg will contribute to P deficiency
- Stiff, brittle leaves, upward leaf curl along margin
- Poor flavour and colour in carrots

12. Phosphorus (P)

- Slow growth, stunted plants, delayed maturity
- Dark green or blue-green leaves with purplish color on older leaves
- Can happen early in the season with cool weather
- Poor fruit and seed development

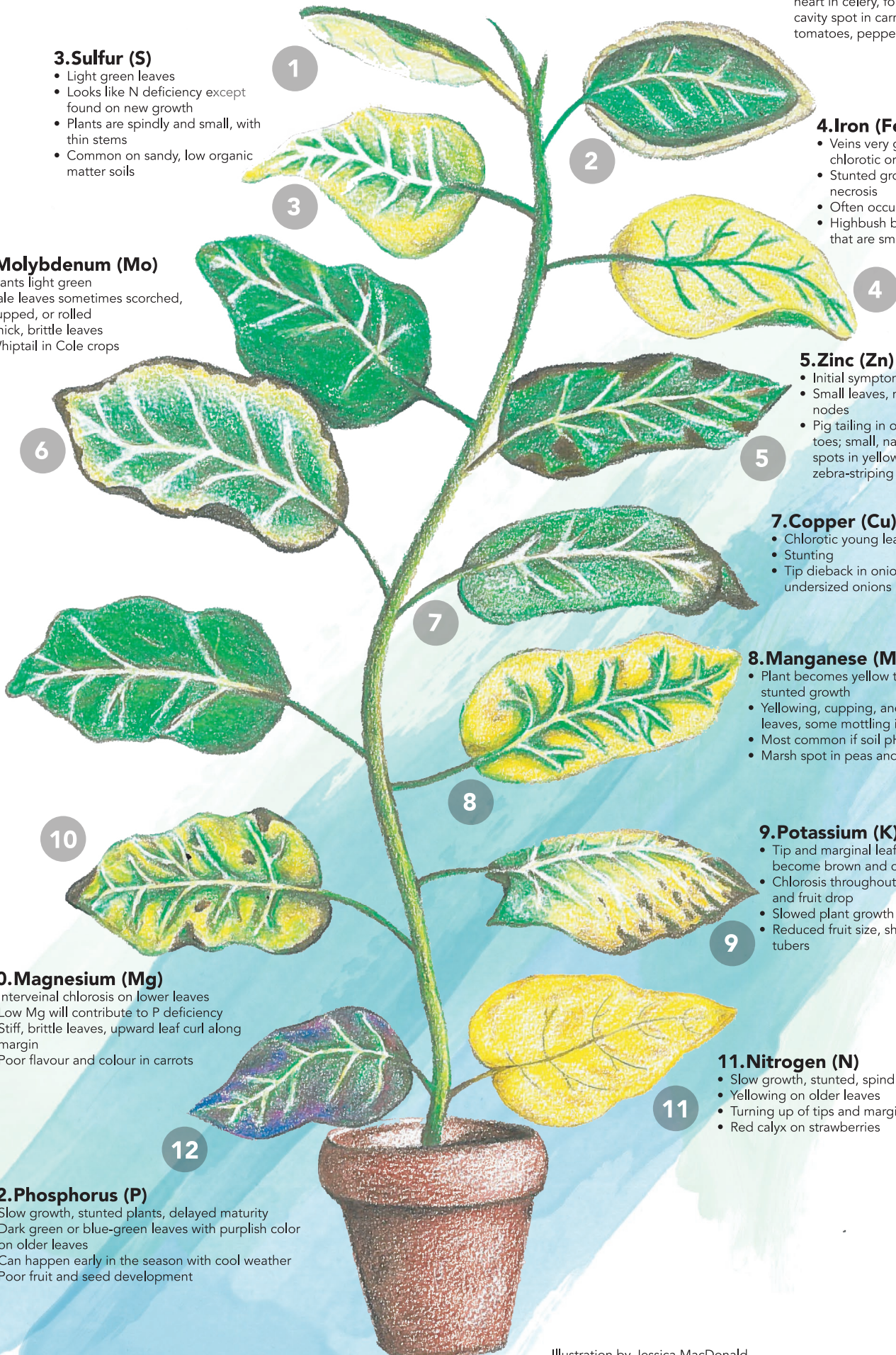


Illustration by Jessica MacDonald

It is important to note that just because a plant is showing symptoms of deficiency, it does not necessarily indicate that your soil is lacking in that nutrient. pH plays a role in nutrient availability, for example, and excess of one nutrient can cause a deficiency in another nutrient. Talk to your agronomist.