

# Hops

## Sampling Notes

The nutritional status of Hops is monitored using soil tests and plant analysis. As a perennial high-yielding crop plant, regular monitoring is important to help sustain optimum levels and avoid nutritional disorders. If disorders do occur, rapid diagnosis is necessary to assist correction.

At this time, varietal nutrition differences are not known.

### Leaf

**Sampling Time:** When bines reach half canopy height. (November-December, depending on varietal growth stage)

**Plant Part:** Youngest mature leaf (blade & petiole).

**Collect From:** Main Stem

**Quantity per Sample:** 3-4 representative leaves from each of 10 bines.

**Recommended Tests:** Basic Plant (BP).

**Comments:** To help diagnose an obvious problem, leaves showing the first signs of the distinctive symptoms should be collected as soon as abnormalities appear. If sampling outside the normal sampling time it is useful to take a second sample of similar, healthy leaves from nearby unaffected plants for analysis as a comparative standard.



### Soil

**Sampling Time:** Pre-plant testing or else every two years for established blocks, in late winter to early spring.

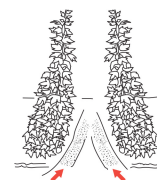
**Core Depth:** 15cm

**Collect From:** The hill zone of the bines along several rows

**Quantity per Sample:** 12-20 cores

**Recommended Tests:** Basic Soil (BS). Also consider Sulphur profile (S), Available Nitrogen (AN) and Boron (B).

**Comments:** If trickle irrigation (or fertigation) is used, the wetted zones of the soil should be sampled separately, as minerals in the water may produce abnormal test levels. An Irrigation Water test may be useful.



If trying to diagnose a problem with crop growth and yield, samples should be collected from the rooting zones of the worst affected vines. In these circumstances, a second sample taken for comparative purposes from the rooting zones of normal vines may be useful.

## Comments

Because hops are a high yielding plant, they have a relatively large nutrient requirement. The plant is efficient at extracting nutrients from the soil, with potentially high crop removals, so it is important to monitor soil fertility levels regularly. Adequate nutrition will aid both quality and yield of the hop crop.

Soil and leaf testing allows nutrition management before deficiency or toxicity symptom appear.

The majority of hop varieties prefer a soil pH between 5.8 and 6.5.

Hop plants produce a large amount of biomass and require nitrogen in substantial amounts for growth and optimal cone production. Nitrogen application is not advisable after the plant has flowered, as it may cause unwanted vegetative growth. Occasional tests for soil organic matter may be useful.

Potassium is also important for bine growth and cone development. Some potassium will be recycled to the soil if spent bine and leaf biomass is returned to the hop garden as mulch or compost, but this may not be immediately available for plant uptake. Symptoms of potassium deficiency include marginal leaf scorch and poor growth.

Hops have a fairly low requirement for phosphorus, relative to nitrogen and potassium. Phosphorus deficiency symptoms include thin, weak bines, brown discoloration on cones and down-curved dark green leaves lower on the stem.

Magnesium deficiency may be induced if the soil is high in potassium or calcium. Deficiency symptoms are mainly interveinal yellowing in older leaves.

Boron is an important trace element for hops. Deficiency symptoms include delayed shoot emergence, small distorted leaves, stunted growth and poor cone development.

Hops are also sensitive to zinc deficiency, which may affect crop growth and cone production.

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## References

Blackmore, L.C; Searle, P.L and Daly, B.K. 1987. Methods for chemical analysis of soils. NZ Soil Bureau Scientific Report 80. NZ Soil Bureau, DSIR.

Reuter, D. J. and Robinson, J. B. (Eds) 1997. Plant analysis. An interpretation manual. Second edition. Fertility Guide for Hops. HAPI Hop Research Centre, USA.

Dodds, K. 2017. Hops - A Guide for New Growers. NSW Department of Primary Industries, Skills & Regional Development, Australia

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## Disclaimer

Normal Range levels shown as histograms in test reports relate specifically to the sampling procedure provided in this crop guide. The Normal Range levels in test reports and Comments provided in this Crop Guide are the most up to date available, but may be altered without notification. Such alterations are implemented immediately in the laboratory histogram reports. It is recommended that a consultant or crop specialist be involved with interpretations and recommendations.

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