SILICON, PLAINLY

Silica for growers

DIY methods vs. ready-made

Every grower hears that silica toughens plants up. Fewer hear the part that actually decides whether it works: **most of the silicon on the planet sits in a form roots can't touch.** Here's what the common DIY sources really deliver, and where a ready-made bottle fits in.



START HERE

Why silicon is worth bothering with

Structure

Silicon is laid down in and around cell walls, where it cross-links with hemicellulose. Stems stiffen, branches carry weight, plants hold themselves up instead of leaning on you.

Pest & disease

In the published research it forms a cuticle-silica layer under the leaf surface, and the plant's own defences — enzymes, phenolics, lignin — are more active where silicon is present.

Heat & drought

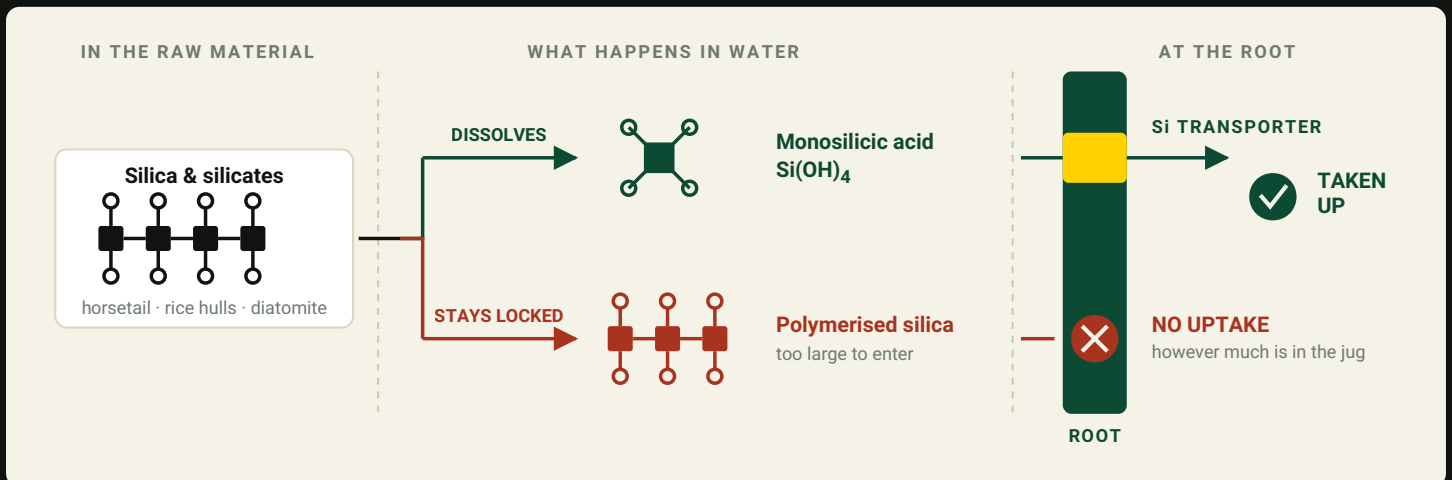
Under heat and water stress, silicon-fed plants hold leaf water potential better, use water more efficiently and keep photosynthesis ticking along.

Worth being straight about: silicon isn't classed as an essential nutrient — a plant will finish a run without it. It's what plants do with it when it *is* there that growers notice.

THE BIT THAT MATTERS

Plants can't drink rock

Horsetail, rice hulls, diatoms, sand — all genuinely loaded with silicon. But it's sitting there as silica and silicates: long polymerised chains. Roots don't take that up. Plants absorb silicon in exactly one form — **monosilicic acid, $Si(OH)_4$**, a single small uncharged molecule that fits through the silicon transporters in the root. Everything else has to break all the way down to that first, or it does nothing at all.



Soluble isn't permanent, either. Silicic acid only stays as single molecules while the solution suits it. Concentrated or mixed in the wrong order, it links back up into silica gel and drops out of reach — which is exactly why silica goes into the tank first, on its own, and gets pH'd before anything else joins it.

SIDE BY SIDE

What each source actually delivers

SOURCE	WHAT IT ACTUALLY IS	PLANT-AVAILABLE YIELD	CONSISTENCY	TIME & LABOUR
Horsetail tea EQUISETUM ARVENSE	Dried herb runs **5–7.7% silicic acid and silicates**. Only about a tenth of that is water-soluble to begin with — call it 0.5–0.8% of dry weight.	▮▯▯▯▯ A standard unboiled tea pulls out **~0.3% of the dried plant's weight** as silicon — under half of even the soluble share. Long soaking and boiling lifts it.	Swings with species, season, plant age and how you brew it.	Harvest, dry, soak, boil for hours, strain. Every batch.
Rice hull ash ASH OR HOME EXTRACT	The ash itself is **>90% silica** — amorphous if it's burnt under about 700 °C, crystalline above it.	▮▯▯▯▯ Raw ash in a reservoir does little. Soluble silicate needs a hot caustic (NaOH) extraction, then neutralising.	Burn temperature decides the lot. Hard to control in a drum.	Ashing plus wet chemistry — this one stops being gardening.
Diatomaceous earth NATURAL, UNCALCINED	Fossil diatom silica, **>70% SiO_2**, already amorphous and porous.	▮▮▯▯▯ Water-soluble Si sits in the low mg/kg. Real release, but across a soil season — it's an amendment, not a tank additive.	Grade, particle size and soil pH set the release. Works over months, not days.	Easy to spread. Mask up — natural DE can carry up to ~4% crystalline quartz. Never use calcined pool grade.
Bamboo leaf TEA OR HOME EXTRACT	Richest of the common plant sources — leaves **17–23% silica**, leaf ash **76–83% SiO_2**.	▮▯▯▯▯ As a tea, the horsetail story again. Doing it properly needs the same caustic-and-acid route.	Excellent raw material, very hard to standardise on a bench.	Sourcing bamboo leaf in any volume is the first job.
Bloom Silica READY-MADE	**31% silicon** from monosilicic acid, plus **21.2% soluble potash (K_2O)** derived from potassium silicate.	▮▮▮▮▮ Goes in already soluble — nothing to ash, steep or extract between the bottle and the root.	Same figure out of every bottle. Nothing to standardise.	0.33 ml/L. pH it first, on its own in the tank, then add the organics.

Bars show how much usable silicon survives the preparation a grower would actually do — not how much silica is in the raw material. Bloom figures are taken from the product label.

WHERE WE LAND

No knock on doing it yourself

If you like making your own inputs, a horsetail or bamboo brew is a fine thing to have on the bench, and diatomaceous earth earns its place in a soil mix. The catch isn't whether DIY can work. It's that **you can't know how much plant-available silicon you actually put in** — and with silicon the only number that counts is how much soluble silicic acid reaches the root, not how much silica was in the raw material.

That's all a ready-made bottle really buys you: you know what went in. If the process is half the fun, keep at it — just run a control alongside it and let the plants settle the argument.

MIXING ORDER — GET THIS ONE RIGHT

Silica goes in first, on its own, and gets pH'd before anything else joins it. Potassium silicate is strongly alkaline and will spike a tank. Once it's settled where you want it, add the organics and the rest — then stop chasing the pH.

Bloom Silica

SILICON
31%
from monosilicic acid

SOLUBLE POTASH
21.2%
K_2O from potassium silicate

RATE
0.33 ml/L

SIZES
250 ml · 1 L · 5 L · 15 L

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Sources: EMA/HMPC assessment report on *Equisetum arvense* L., herba (silica content and water-extractable fraction) · *Front. Plant Sci.* 6:853 (2015) (uptake form and solubility limit) · *Front. Plant Sci.* 8:701 (2017) (silicon and plant–pathogen interactions) · *3 Biotech* 9:73 (2019) (silicon and abiotic stress) · *IJCRT* 13(6) (2025) (silica extraction from rice hull ash) · *MATEC Web Conf.*, RSCE 2018, art. 05021 (bamboo leaf ash silica) · *Soil Systems* 10(9):100 (2025) (diatomite as a silicon source) · OSHA standard interpretation, 24 Aug 2012 (crystalline silica in natural vs. calcined diatomaceous earth) · Bloom Silica guaranteed analysis from the product label.