



An Introduction to Controlled Release Fertilisers (CRF)

<http://icl-growingsolutions.com>

What are Controlled Release Fertilisers?

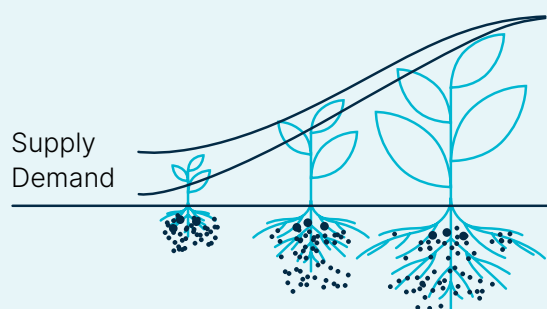
Controlled Release Fertilisers (CRFs) are an advanced range of products that release nutrients over a specific timescale, in a controlled way. This ensures nutrient availability matches the crop's requirements more effectively than standard fertilisers, leading to higher Nitrogen Use Efficiency (NUE) and reduced nutrient loss.

Benefits

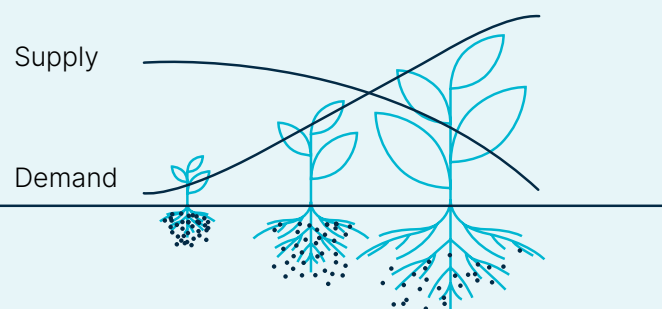
By providing consistent and predictable nutrient release, CRFs bring a range of benefits to all crops. Trials conducted with root vegetable, brassica, and allium growers show yield uplifts from 8% to 16% versus standard farm practice.

1. Higher Nitrogen Use Efficiency versus other N fertilisers
2. Increase yields per tonne of Nitrogen input, or maintain yield with less fertiliser
3. Reduce costs, through less fertiliser applications and a reduction in farm traffic and soil compaction
4. Produce better quality crops – greater uniformity and colour leading to more marketable product
5. Reduce your environmental impact

CRF Application



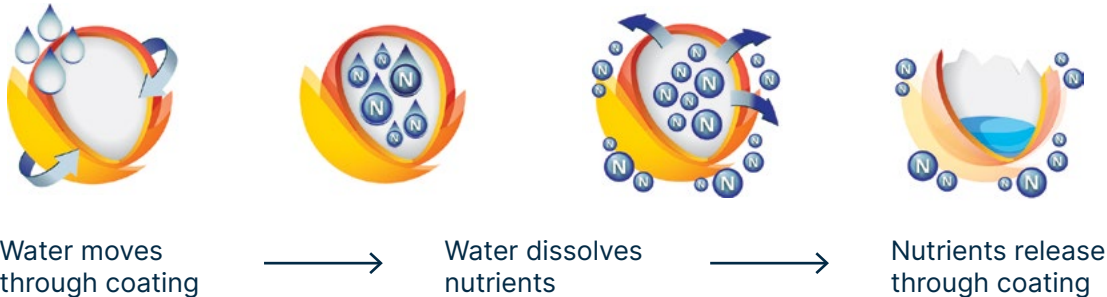
Other Fertilisers



With CRF, the supply of nutrients matched the demand of the plants, optimizing both growth and nutrient efficiency

CRF Technology

CRFs are temperature-sensitive. As soil temperature rises, cracks develop in the coating, drawing in water to dissolve the nutrients inside. The water then carries these out into the soil for the plant roots to take up. When soil temperature decreases, nutrient release slows down.



As CRFs match the growth needs of a plant, nutrient uptake is fully optimised by the crop. In comparison to conventional nitrogen fertilisers which average around 60% NUE, in a recent UK winter wheat trial Agrocote Max achieved an NUE of 97%.

Below are results from an Agrocote Max trial on a UK broccoli crop versus ammonium nitrate.

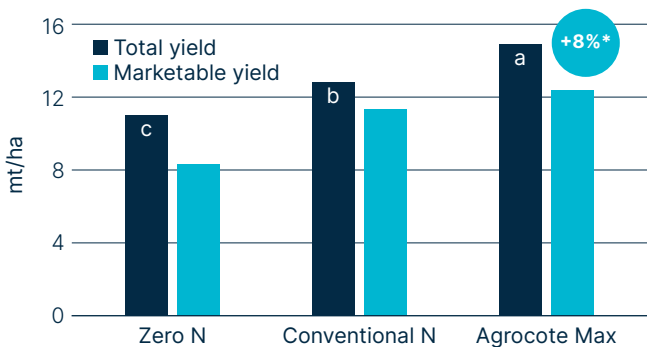
Treatments

Treatment	Product	N rate, kg/ha	Timing
Zero N	Zero nitrogen	-	-
Conventional N	Ammonium nitrate 34.5-0-0	150 75	Before planting 4-5 weeks after
Agrocote Max	Agrocote Max 44-0-0, 1-2M, 100% coated N	225	Before planting

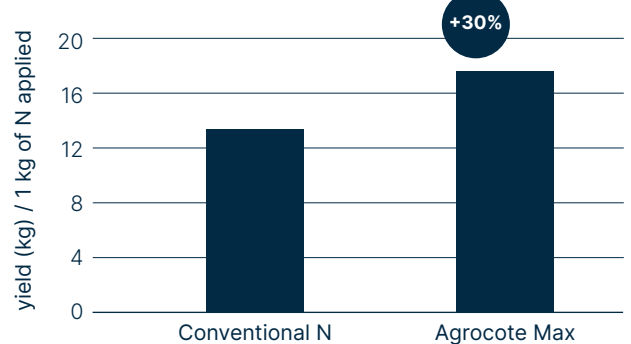
Based on soil analysis, all treatments received the same level of P and K before planting

Results

Yield



Nitrogen Use Efficiency (NUE)



Statistically significant differences at p=0.05

Economical evaluation

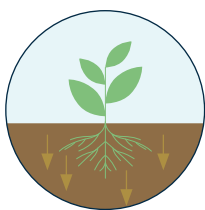
Differences	Gross income, £/ha	Extra cost of fertilisation, £/ha	Gross profit, £/ha
Agrocote Max vs Conventional-N	2144	40	2104

* + extra £15 / ha from fertiliser application savings

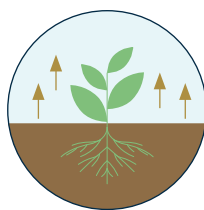
Gross profit was calculated based on broccoli market price of 2.33 £/kg and deducting extra fertilisation cost/ha. (Sources: ahdb.org.uk/GB-fertiliser-prices | fwi.co.uk/prices-trends/horticulture-prices) NUE, Nitrogen Use Efficiency, calculated as Agronomic Efficiency based on economical yield, $AE = (YF - Y0) / F$.

Controlled Release Fertilisers limit the environmental impact

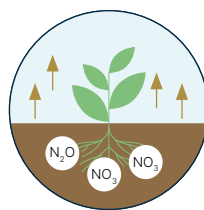
Based on the latest EU trial results, 40-50% of the total nitrogen applied with conventional urea can be lost. CRFs limit these losses to just 16%. When compared to conventional urea CRFs reduce nitrogen losses and improve nutrient use efficiency. In summary CRFs can provide:



54%-61%
reduction in leaching



32%-54%
reduction in ammonia
volatilisation



11%
less denitrification

Agrocote®, Agroblen® and Agromaster® NPK grades are part of ICL's Controlled Release Fertiliser (CRF) range. Available through on farm distributors.

