

Enzymes boost nutrients and residue breakdown

An emerging new product category for farmers, enzymes are destined to play an invaluable role in Australian agriculture – to convert unavailable nutrients like phosphate into plant-available forms, or to break down carbon residues and soil organic matter into available nutrients.

Enzymes are produced naturally in the soil by microbes and plant roots. By applying additional enzymes, growers are able to accelerate and enhance these natural processes.

USA life-sciences company Elemental Enzymes has isolated and patented many enzymes that improve the efficiency of nutrient-use in crops and pastures; provide better growth and returns from applied nutrients in fertilisers; speed up stubble breakdown; and boost overall soil health.

Depending on the type, enzymes can be applied in a variety of ways to suit current farming practices – including directly onto the soil surface in water or herbicide; in-furrow with liquid or solid fertiliser; as a side-dressing; or as a seed treatment.



Chris Ramsay

Elemental Enzymes Australia national sales and marketing manager **Chris Ramsey** said the company's products replicated enzymes naturally secreted by plants and microbes, providing readily-available, highly-concentrated



Stalks of wheat stubble with red dye indicating the degree of degradation of cellulose after seven days, with untreated stubble on the left. On the right is stubble treated with enzymes, exposing lignin and cellulose, enabling more rapid degradation by microbes.

forms that disperse through soil, and quickly get to work in a range of soil moisture and pH (5-10) conditions.

He said the advantages of applying enzymes vs microbes are that enzymes are more consistent and disperse more rapidly and widely in the soil. Reactions will begin as soon as they are applied and will continue for days up to weeks.

“Enzymes applied with fertiliser at planting start to work immediately and continuously near the seed, accelerating the release of plant-available nutrients so plants germinate into a nutrient-rich zone for better emergence and establishment.”

Used by farmers in the USA for several years, two enzyme products Lumen and Res+ were tested in Australia last season and will be introduced here by Elemental Enzymes as soon as the necessary protocols are in place.

Lumen – an enzyme for use with liquid fertilisers or as a stand-alone side dressing – will enhance the uptake of water and nutrients by plant roots, improving plant growth and yield, and the health of soil and plants.

“This concentrated blend of two important enzymes will trigger soil organic matter to release bio-available nutrients and water to the plant and stimulate native microbial activity. At the same time, it will act around the outer layers of the root tip to create ideal soil conditions for plant root growth.

“Suitable for all dryland and irrigated broadacre and row crops, Lumen will be ideal for planting and as side dressings during critical growth and nutrient-demand periods.

Supplying the right amount of enzyme, where and when it is needed, will maximise the use of nutrients in fertilisers and from soil organic matter and residues.”

Mr Ramsay said Res+ will improve and accelerate residue breakdown in a wide range of environmental conditions, kick-starting soil microbial activity and increasing potential yield of newly-planted crops.

“The liquid product contains a residue-degrading enzyme; chelated nutrients (including 5% N) to provide soluble nutrients to fungi and microbes for optimal stubble degradation; plus a humectant to lock in moisture and speed up natural degradation. The residue-degrading enzymes expose the lignin and cellulose for more rapid degradation of stubble by microbes.

“After harvest, Res+ sprayed onto stubble 0–4 weeks before the next sowing, or added to pre-planting knockdown and pre-emergent herbicides, will start stubble breakdown and trigger nutrient release, providing nutrient-rich soil prior to planting for improved crop or pasture establishment.”

Mr Ramsay said these first two Elemental Enzymes products would potentially be available for limited release in Australia for this winter broadacre cropping season.

“We will notify the market through *Rural Business* as soon as product is available in Australia.”