



**BRANDT**<sup>®</sup>

**BRANDT**<sup>®</sup> EnzUp<sup>®</sup>

**Prime Your Soil for Success**

Patent Pending Enzyme Technology



A close-up photograph of rice panicles in a field. The panicles are golden-brown and are surrounded by vibrant green rice leaves. The background is softly blurred, showing more of the rice field under bright, natural light.

## BRANDT EnzUp

BRANDT EnzUp is a groundbreaking new enzyme technology that enhances water and nutrient availability, uptake and use by the roots and increases microbial activity. The result is improved soil and plant health, increased root mass and improved drought and stress tolerance.



# Revolutionary Enzyme Protection Process Keeps Enzymes Active in Soil Longer and Improves Efficacy

BRANDT ENZUP enzymes undergo a patent pending process that prevents the enzymes from degrading in the soil too quickly after application. This allows them to remain active longer and substantially increases enzyme efficacy. This is an entirely new technology and scientific breakthrough for agriculture.

## The Importance Of Enzymes and How They Function In Crops

- Enzymes are non-living proteins made by plants, microbes or other organisms in the soil proteins.
- Enzyme activity is an indicator of healthy soils.
- Enzymes act as catalysts that perform very specific functions and create chemical reactions in the soil. Typically, enzymes either cleave something apart or pull something together. Enzymes impact:
  - Organic matter breakdown
  - Nitrogen fixation and conversion
  - Nutrient availability and uptake
  - Pesticide degradation

## The Difference Between Enzyme and Microbial Products

Microbial products contain live microbes. To survive in the soil, microbes require nutrients, optimal pH, salt and organic matter - which causes them to have a high death rate, especially during harvest and tilling. It takes months to build up microbe levels in the soil.

In contrast, enzymes are non-living organisms, which makes them more stable in the soil. When they are applied to the soil, they are immediately active and perform consistently across all soil types.

## Key Benefits of BRANDT EnzUp



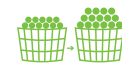
Improved plant health, improved nutrient and water uptake



Improved stress tolerance



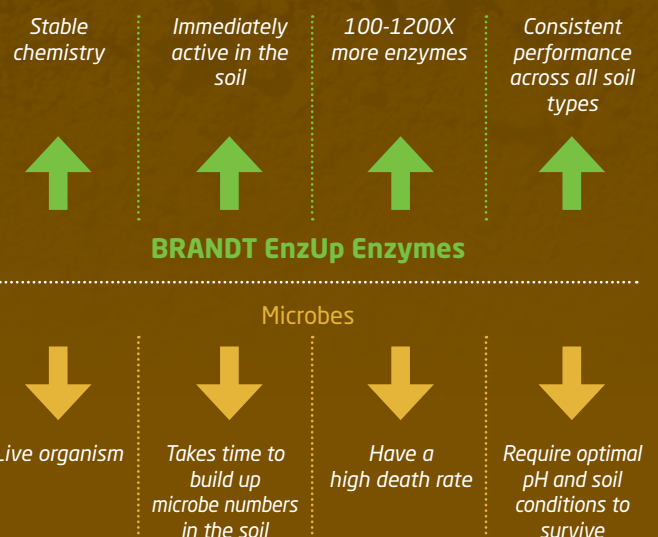
Improved quality and yield



Enhanced plant response to applied fertilizers - increased bushels

UP TO **15%** YIELD INCREASE\*

\*Source: BRANDT Field Trials 2016-2018



**BRANDT EnzUp**

## Enzymes: Boost Nutrient Availability and Uptake

### Get More from Your Fertilizer Investment

This new technology contains a high concentration of enzymes that boost nutrient availability and converts organic matter into smaller, digestible units. Which creates a rich soil environment for the seed.

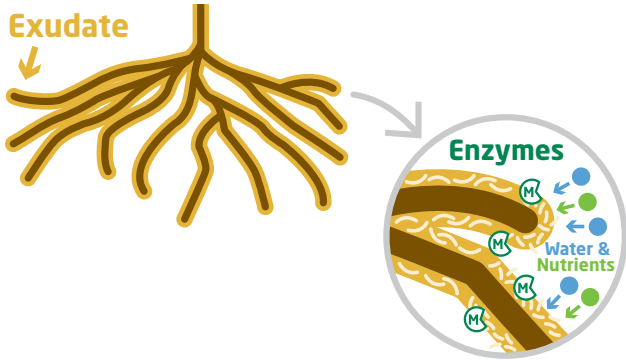
#### Key Benefits

- More water and nutrient uptake
- Increased plant response to fertilizer applications
- Gets plants off to a strong start
- Increased microbial activity
- Larger, healthier root systems
- Improved stress and drought tolerance
- Increased yield

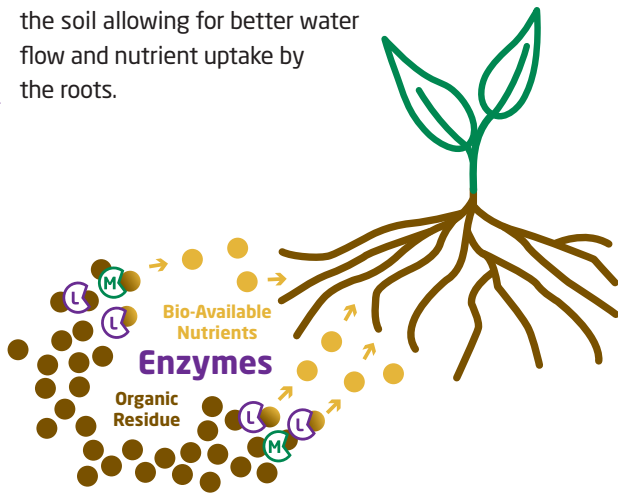




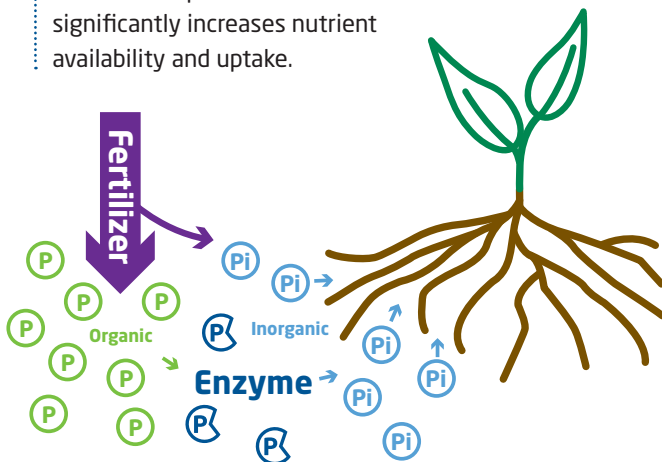
**M** **Mannanase enzyme** - its primary function is to break down starches in the exudate that surrounds the outermost layer of the root tips. This chemical reaction creates a draw of water and nutrients to the root zone and releases sugars to the plant. This in turn boosts root growth and increases microbial activity.



**L** **Lipase enzyme** - its primary function is to break down lipids in root exudates and organic residue in the soil allowing for better water flow and nutrient uptake by the roots.



**P** **Phosphatase enzyme** - its primary function is to convert tied up organic phosphate into soluble, bio-available phosphate that is immediately available for plant use. This reaction significantly increases nutrient availability and uptake.



### Zinc and Enzyme Interaction

All enzymes need a co-factor for activation. For Lipase and Mannanase enzymes, zinc is that co-factor. The zinc ignites enzyme activity, which allows the enzymes to perform their chemical reactions faster and more effectively. The boost in enzyme activity increases total water and nutrient uptake.



### Unleash the Organic Phosphate in Your Soil

% Organic Matter	Soil Organic Matter (lbs/acre/ft) approx	P <sub>2</sub> O <sub>5</sub> tied up as Organic P (lbs/acre/ft of soil) approx
0.5	17,150	230
1.0	34,290	460
1.5	51,440	690
2.0	68,590	910
2.5	85,740	1,140
3.0	102,890	1,370

(Doran 2012)

# BRANDT EnzUp Formulations

## Dry Soluble Formulations

### BRANDT EnzUp K DS

5-0-49 8.0% S

Derived from potassium nitrate, potassium sulfate and muriate of potash

**P**  $3.5 \times 10^2$   $\mu$ Units/g **M**  $1.5 \times 10^6$   $\mu$ Units/g

### BRANDT EnzUp P DS

12-58-0

Derived from monoammonium phosphate

**P**  $5.0 \times 10^2$   $\mu$ Units/g **M**  $2.2 \times 10^6$   $\mu$ Units/g

### BRANDT EnzUp S DS

21-0-0 23.0% S

Derived from ammonium sulfate and urea

**P**  $5.0 \times 10^2$   $\mu$ Units/g **M**  $2.2 \times 10^6$   $\mu$ Units/g

## Liquid Formulations

### BRANDT EnzUp Mn

3.0% Mn

Derived from manganese EDTA

**L**  $2.0 \times 10^3$   $\mu$ Units/mL **M**  $1.0 \times 10^6$   $\mu$ Units/mL

### BRANDT EnzUp Zn

4.0% Zn

Derived from zinc EDTA

**L**  $2.0 \times 10^3$   $\mu$ Units/mL **M**  $1.0 \times 10^6$   $\mu$ Units/mL

## Seed Treatments

### BRANDT EnzUp Grain ST

4.0% Zn

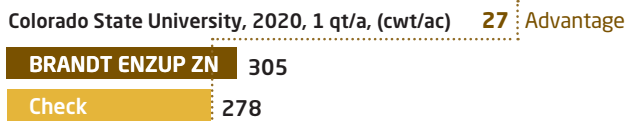
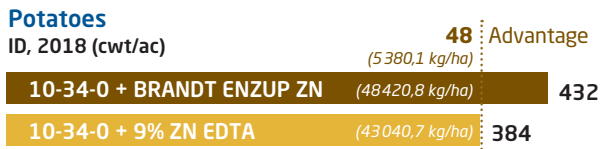
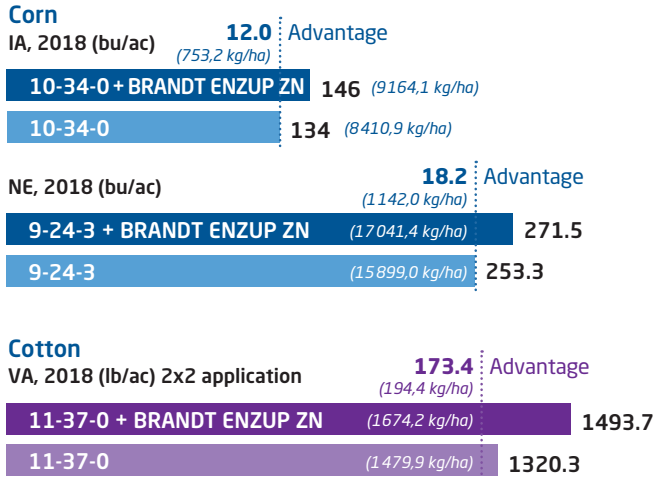
Derived from zinc EDTA

**L**  $32 \times 10^3$   $\mu$ Units/mL **M**  $16 \times 10^6$   $\mu$ Units/mL

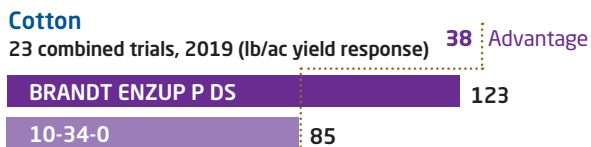
**M** Mannanase enzyme **L** Lipase enzyme  
**P** Phosphatase enzyme



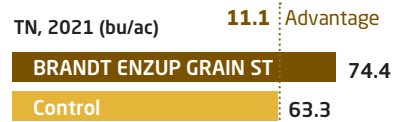
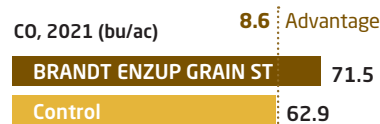
## Liquid Formulation Field Trials



## Dry Formulation Field Trials



## Seed Treatment Field Trials



These products may only be sold in states where registered or where registration is not required. For further information, please contact your BRANDT representative.

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