



## hydra<sub>val</sub><sup>TM</sup> *For use on Sunflower or safflower*

### What is hydra<sub>val</sub> and why use it?

hydra<sub>val</sub> is a targeted mix of microbial endophytes screened for and selected to induce a favorable crop response in sunflower and safflower. Some benefits include: Increased head size, increased pollination success, stronger roots and stalks, reduced ethylene production (associated with aging and senescence), larger leaves on the plant, pH regulation, and general stress mitigation.

### Mechanisms of actions:

- Recycles electron receptor nutrients more effectively so pH is stabilized, and the plant can continue to grow without slowing down for the balance to occur.
- Promotes stem growth and allows the head to stay upright longer throughout the day and in hotter temperatures.
- Promotes increased stem diameter in low water years.
- The iron solubilizer within the bacteria (siderophore) causes increased levels of iron in the leaves to promote photosynthesis.
- If the flower becomes damaged or removed early in the growing season, the stress response hormone causes the bacteria to trigger multiple replacement flowers to develop

### What to watch for:

Improved seedling vigor. Increased heads per plant – especially when the primary flower is lost. Enhanced seed size/weight of shelled kernels with more consistency of size. Oil content at harvest may also be higher. Reduced daily heat stress symptoms. Improved leaf area for synthesis and nutrient transport. Watch for bigger stalks with less snapping and an overall stronger plant.

### Morphological response:

- Increase kernel weight
- More consistent seed size at harvest
- Bigger tap root
- Larger stalk
- Larger and more robust leaves
- Head stays up longer to allow better pollination

### How to apply:

**Seed:** 1 cup dry powder per 50 lbs. in planter box or box to box.

**In furrow:** 16 fl. oz. per acre and minimum of 5 gpa total volume.

**Foliar:** 16 fl. oz. per acre with 10 to 20 gallons water. Generally, hydra<sub>val</sub> is applied with water alone, though it may be tank mixed with other products. While the window of application is not limited, earlier plant growth stages provide a better response. Generally, a V3-V6 application is ideal.

### Tank mixtures:

No surfactant is needed for the microbes to enter the plant, though a surfactant may be acceptable if tank mixing with other products (perform a jar test to verify compatibility of product mixture). Do not use with antimicrobial water conditioners, or water containing levels not approved under EPA human drinking water standards. This includes copper, bleach, fluoride, chloramines, chloride, bactericides, phosphoric or sulfuric acid. Do not use with propiconazole (Slant<sup>TM</sup>, Tilt<sup>®</sup>, Quilt<sup>®</sup>...). Mixing with glyphosate may result in microbial mortality.



**Cautions:**

Should not use hormone-based plant growth regulators (PGR) with this product because the combination may result in stunted plant growth. Do a jar test to verify compatibility with other products.

**Spray tip selection**

TEEJET™ XR, XRC OR TEEJET TURBO		
	Line Pressure	Application Speed
Red Tip	20 psi	8 mph
Red Tip	30 psi	10 mph
Red Tip	Max 40 psi	12 mph
Brown Tip	20 psi	8 mph
Brown Tip	30 psi	10 mph
Brown Tip	Max 40 psi	12 mph

**Application Standards:**

Follow good sprayer (and line and nozzles) cleanout before using these biologicals. Don't mix concentrated microbials with concentrated pesticides or fertilizers.

For foliar applications use a minimum of 10 gpa total solution.

Aerial application is acceptable, but thoroughly clean the system and use hydraval and water only.

Screen size recommendation: Not smaller than 50 mesh. No tip screen required.

Residence time on the plant before rain (rainfast): 3 hrs.

Application temperature range: 40° to 85° F (4° to 29° C)

**Improving yield:**

For best results apply proper nutrients and rates so they don't become the yield limiting factor. BioPryme can also be used to support seed development and maximize yield. Best timing to apply BioPryme would be after pollination, as seeds start to develop and fill. BioPryme contains plant nutrients and enzymes that enhance yield and facilitate the flow of plant synthates to the seed.

**Storage and use:**

Store between 50° and 90° F in a place out of the sun. Use contents within 72 hrs. of opening the seal on the container.

Shake container well before using. Keep jugs upright and don't "burp." This is a combination of living organisms in the jug so be mindful that it may swell or contract. The jug has a pressure sensitive seal and will self-regulate as designed.

**Guaranteed Analysis:**

Soluble Potash (K<sub>2</sub>O) 1.00% From potassium carbonate

**Nonplant food:**

*Pseudomonas fluorescence* 1.0 x 10<sup>5</sup> CFU/ml

*Bacillus subtilis* 1.0 x 10<sup>2</sup> CFU/ml

Microorganisms exempt from CFR requirements – 40 CFR 725.

**Packaging:** 2 x 2.5g jugs, bulk