

## **Establish Liquid**

### **Plant Signal Technology for pea and lentil**

Registration Number 2012071A Fertilizers Act

#### **MINIMUM GUARANTEE**

Biological signal molecules

Hesperetin 0.0063 % (w/w)

Naringenin 0.0025 % (w/w)

#### **Net contents**

9,672 grams (9,672 ml)

MANUFACTURED FOR AND DISTRIBUTED BY:

LOVELAND PRODUCTS CANADA INC.

789 DONNYBROOK DRIVE

DORCHESTER, ONTARIO N0L 1G5

PRODUCT INQUIRIES: 1-800-328-4678

24HR EMERGENCY CONTACT: 1-800-561-8273

#### **Caution**

Store the container of ESTABLISH™ liquid out of direct sunlight and between 4 °C and 25 °C. This product contains biological signal molecules. When handling this product, exercise due care by limiting direct contact with the product. The use of chemical-resistant gloves, safety goggles, a NIOSH approved respirator, and other suitable protective clothing is recommended when handling this product.

#### **Directions for use**

ESTABLISH liquid comes with a small bottle containing 21.5 milliliters of signals and a large plastic bag containing the liquid carrier. To use ESTABLISH liquid as a seed treatment:

- First pour the entire contents of one small bottle of signals into one bag of liquid carrier, replace the cap on the bag, and shake well to mix
- Apply the contents of the bag evenly to 120 bushels of seed (about 3 ml per kg seed). To accomplish this, replace the cap on the bag with the supplied hose and spigot, hang the bag upside down and drip the contents of the bag onto the seed as it is augured into the planter or transfer wagon. To ensure proper mixing, do not run the auger at more than half its capacity. The rate of flow onto the seed in the auger can be calibrated by adjusting the spigot valve.

#### **Chemical compatibility**

Some seed treatments can negatively affect the activity of ESTABLISH liquid. Contact your dealer or Loveland Products Canada Inc. at 1-800-328-4678 for the most current information on seed treatment compatibility.

This case of ESTABLISH liquid will treat 3,267 kg (120 bushels) of pea and lentil seed.

Use of ESTABLISH liquid has been demonstrated to increase yields of pea and lentil crops.

ESTABLISH liquid is a unique product that enhances the stimulation of *Rhizobium leguminosarum* bv. *viciae* bacteria, whether naturally present or added to the soil, that starts the process of nodule development on the roots of pea and lentil plants. The stimulation of the *Rhizobium* bacteria by specific signal molecules, which are naturally exuded in very small amounts by the pea and/or lentil plant roots, is an extremely important event in the mutual recognition of the plant and bacteria as symbiotic partners, ultimately resulting in root nodule formation. Therefore, the recognition of these signal molecules by the *Rhizobium* bacteria is critical to root nodulation, which is the site where biological nitrogen fixation takes place.

ESTABLISH liquid is formulated with naturally occurring biological signal molecules that enhance and hasten this very specific recognition step between the plant and the *Rhizobium* bacteria, ultimately leading to earlier nodulation and nitrogen fixation. ESTABLISH liquid should be applied directly to the seed.

Under the low soil temperature conditions present at sowing, ESTABLISH liquid hastens the recognition of the plant roots by the *Rhizobium* bacteria, which can lead to earlier nodule formation and reduces the nitrogen deficiency period that pea and lentil plants experience early in the growing season. An earlier and more consistent supply of available nitrogen can lead to better plant growth and improved performance.

ESTABLISH liquid will perform when there is an adequate population of *R. leguminosarum* bv. *viciae* bacteria in the soil. The addition of a separate inoculant is only required on virgin land with no history of growing either peas or lentils.

**THIS IS A DATED PRODUCT - DO NOT USE AFTER EXPIRATION DATE ON LABEL**

#### **WARRANTY DISCLAIMER AND NOTICE**

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