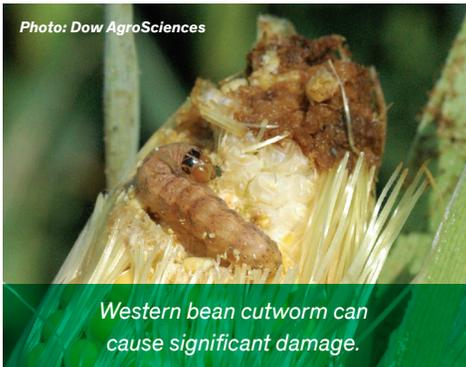




# MANAGING WESTERN BEAN CUTWORM WITH THE CRY1F CORN TRAIT



## UNDERSTANDING THE PEST

Western bean cutworm (WBC), a pest of corn and bean crops, often occurs sporadically in nature with regard to frequency, distribution and level of pressure. WBC has one generation per year and resident populations are most commonly found in fields with sandy soils.

In corn, egg masses are laid on the upper-side of leaves in the top half of the plant and in the whorl just before tassel emergence. Larvae hatch and feed on tassels and pollen before moving down the plant onto silks and into the ear. There is the potential for multiple larvae per ear and an extended egg-laying period. Once larvae enter the ear, they become very difficult to control.

## IN-PLANT PROTECTION

In-plant insect protection-containing traits from *Bacillus thuringiensis* (*Bt*) are the most convenient, effective method for controlling yield-robbing insect pests in cornfields today. Dow AgroSciences trait technologies Herculex®, PowerCore® and SmartStax® offer control of above-ground insects, and all contain Cry1F. As with any *Bt* trait, the level of control observed depends on a number of factors, including the level of insect pressure and the innate variability in sensitivity of the insect to the *Bt* trait.

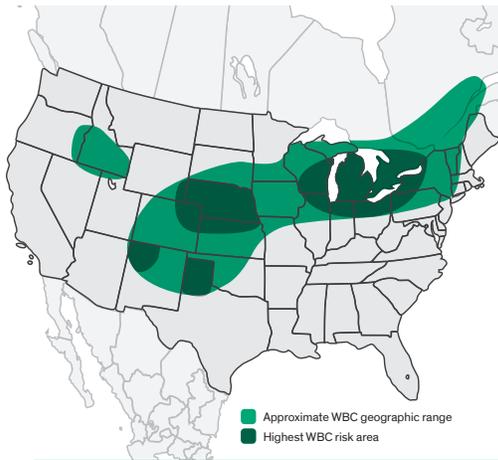
WBC larvae must feed on corn tissue in order to ingest the Cry1F protein, often resulting in some level of observable ear damage. While the level of feeding damage may be higher in some years than in others, the effect on yield has typically been considered low and Cry1F protein has provided protection from WBC to below economic injury level. Larvae can grow to be large in size; however, large larvae do not necessarily indicate additional ear damage, as they may be nearing the end of their life cycle.

Historically, Cry1F-expressing corn has provided better protection than foliar insecticides for season-long control, but recently, some growers have reported decreased efficacy and greater feeding damage than in past years. This can be attributed to a number of factors, including high insect pressure; phenology of the corn during peak moth flight and egg lay; agronomic conditions that allow for greater development of larvae on the tip and cob (e.g., husk length and tightness, degree of pollination, etc.); and reduced sensitivity of some insect populations to the Cry1F protein.

## ASSESS THE PEST RISK

Fields with the following risk factors would benefit from Best Management Practices (BMPs) incorporating Integrated Pest Management (IPM) to minimize the risk of economic damage caused by WBC:

- Fields in areas with historical resident populations of WBC
- Fields that have been planted to Cry1F-expressing corn continuously for more than four years
- Fields in which unexpected WBC damage to Cry1F-expressing corn occurred during the previous year
- Fields with high abundance of WBC larvae or egg masses in corn or areas with high moth trap counts



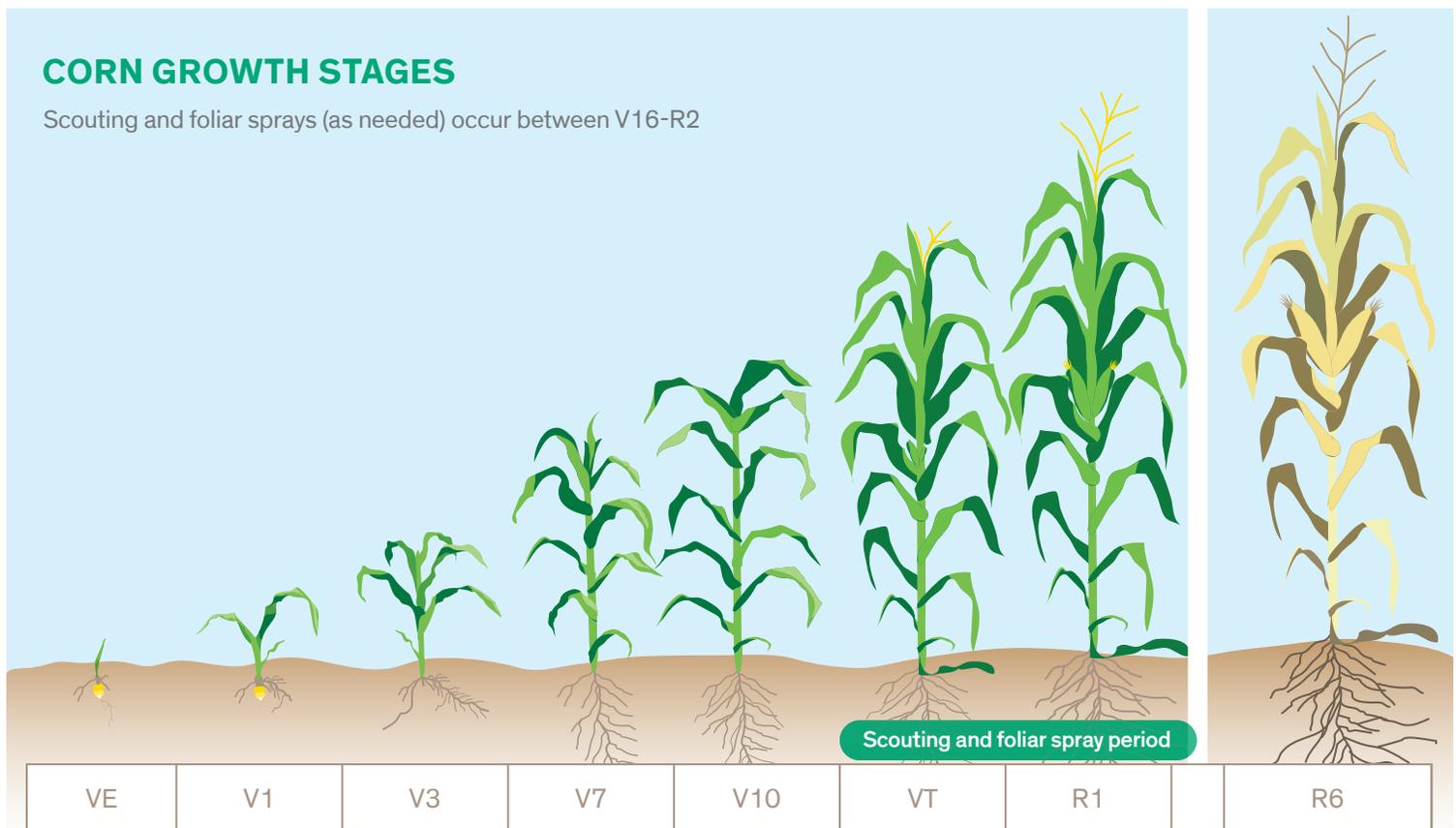
Approximate geographic range of Western Bean Cutworm<sup>1</sup>

## USE B.T. CORN WITHIN AN INTEGRATED PEST MANAGEMENT PROGRAM

1. Monitor moth flights and scout for WBC egg masses from mid-July to late August.
2. Scout corn at V16 to VT during peak moth flight.
3. Use university thresholds (usually recommended between 5% and 10% of plants with egg masses) and insecticides to manage WBC if history of high pressure or unexpected damage exists.
  - Timing is critical for foliar insecticide application. Applications should be made before larvae hatch and enter corn ears.
  - When eggs are laid on VT and older-stage corn, hatched larvae move downward to ears more quickly than in earlier-stage corn.
  - Consider an insecticide with residual activity for protection against extended egg-laying.
4. Monitor for control performance in fields and check for unexpected damage from WBC from August through October.

## CORN GROWTH STAGES

Scouting and foliar sprays (as needed) occur between V16-R2



Please consult with your local seed sales representative, agronomist or university Extension specialist to understand and plan to use best management practices for your area. [Visit www.traitstewardship.com](http://www.traitstewardship.com) for more information.

<sup>1</sup> Figure adapted from Michel et al., 2010. J. Integ. Pest Mngmt. 1(1). DOI:10.1603/IPM10003.

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**Always follow IRM, grain marketing and all other stewardship practices and pesticide label directions. B.t. products** may not yet be registered in all states. Check with your seed representative for the registration status in your state.

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