

# Technical Bulletin



## ***That Was Then; This is NOW!***

### **THE WEED SPECTRUM THEN, WAS VERY DIFFERENT THAN IT IS NOW!**

Back in the late 1990's and early 2000's, TOUGH® 5EC herbicide was sold by Novartis/Syngenta, primarily as a stand alone product at rates of 12-24/oz acre, to combat common weeds impacting dryland corn. Studies conducted in 1999 and 2000 at University of Nebraska showed the predominant weed species were Velvetleaf, Common Waterhemp and Green Foxtail, with densities ranging from 80-120 plants per square yard<sup>1</sup>. During the same time period, research was being conducted on Common Waterhemp, Foxtail, Hairy Cupgrass, and Velvetleaf at Iowa State University and University of Wisconsin<sup>2</sup>. With the advancement of Glyphosate tolerant corn, many companies "shelved" POST products and Syngenta let the TOUGH 5EC registration expire.



Velvetleaf - a predominant weed in the 1990's.

Photo Courtesy of missouri.edu

### **THE AGE OF HPPD'S (GROUP 27)**

HPPD's grew more popular after repeated use of Group 2 herbicides (ALS Inhibitors), in the late 1980's and early 90's, resulted in the rapid selection of ALS resistant waterhemp. HPPD Inhibitors became more widely used in the early 2000's as the spectrum of weeds changed and became resistant to glyphosate and other herbicides. However, in 2010, corn fields in Iowa and Illinois confirmed infestation of a waterhemp population resisting postemergence applications of HPPD herbicides including mesotrione, topramezone, and tembotrione.

### **WEED PRESSURE TODAY**

Resistant weeds today present an even greater challenge for farmers. Resistant weeds such as Palmer Amaranth and Common Waterhemp can produce 100,000 to 400,000 seeds, even when competing with a crop. These seeds are small (1-2mm) and are easily dispersed by wind, animals, livestock feed and equipment. Herbicides that controlled these weeds in the past are now being added to the long list of resistant chemistries, reducing the amount of control and adding to the weed seedbank. A post emergence product that provides 95% control; will still allow 5% (50 plants per acre) to escape. Based on this, the potential for escape can be 20 million seeds per acre! That's 460 per square foot! ***Industry experts agree, the only way, to fight resistant weeds such as Palmer, Waterhemp and Kochia is to introduce multiple modes of action into the tank mix.***



Common Waterhemp escapes in an Iowa field

In 2015, Belchim Crop Protection (Europe) realized the benefits of Pyridate; a Group 6 herbicide with no known resistance, and the impact it would bring to the control of resistant weeds. They initiated the purchase of the product TOUGH® 5EC (Pyridate) and began the process to re-register it in the USA. In September of 2020, Belchim Crop Protection USA was granted EPA approval of TOUGH® 5EC.

*Continued Other Side*

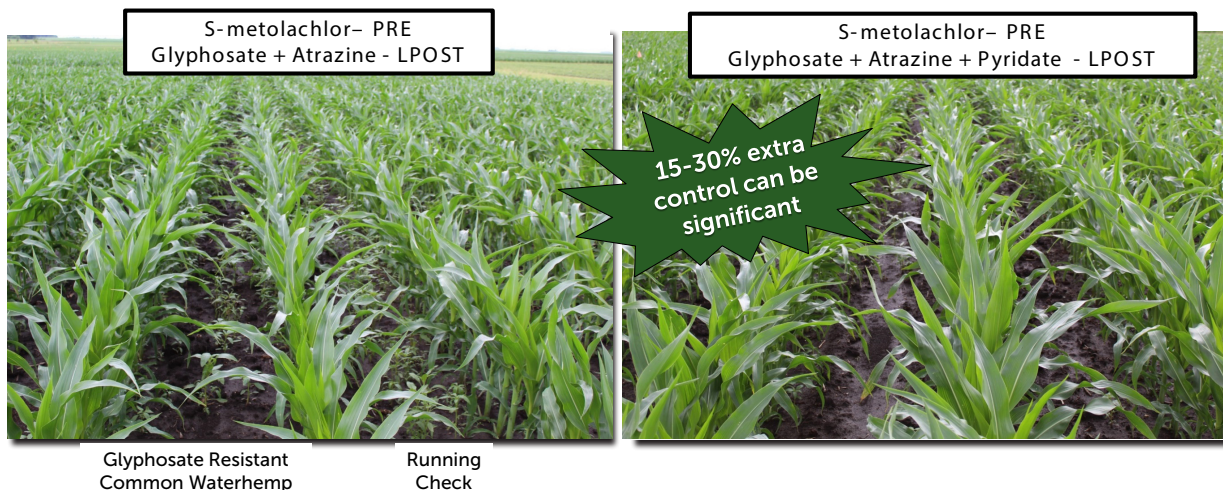
<sup>1</sup><https://cropwatch.unl.edu/timing-weed-control-corn-get-most-effect>

<sup>2</sup>Weed Science, Vol. 47, No. 5 (Sep. - Oct., 1999), pp. 578-584 (7 pages) Published By: Cambridge University Press

Prior to registration, Belchim partnered with university cooperators across the cornbelt to evaluate the optimum application rates and timing to maximize the value of adding TOUGH® 5EC to the POST tank mix. Photos below show the results of one trial that was conducted in Illinois in 2018 that showed the value of adding 8 oz/acre of TOUGH® 5EC to the mix! University trials, and field use continue today showing the increased control of tough to kill, resistant weeds, when TOUGH® 5EC is added to the mix.

## Glyphosate Resistant Common Waterhemp | 10 Days After Application

University of Illinois | Urbana 2018



### Positioning 1990-2000's

- Apply at 12-24 oz rate (alone or in a tank mix)
- Apply to actively growing weeds at any stage of corn growth
- Split applications could be made
- Optimizes atrazine with rates of 12-24 oz

### Positioning Today

- Alternate mode of action to be tank-mixed POST with other chemistries
- Apply at 8 oz rate in a tank mix
- Apply to corn up to the 8- leaf stage
- Synergizes HPPD's (patent pending)
- Enhances atrazine, and Dicamba based products, increasing speed of kill



Photo taken June 30, 2021 at Iowa field. Row treated with Halex® GT and Atrazine on June 8th.



Photo taken June 30, 2021 at Iowa field. Row treated with Halex® GT and Atrazine and TOUGH® 5EC on June 8th.

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