

# The facts on herbicide-resistant waterhemp.

## Know waterhemp by its numbers.

**4,800,000**

Each plant can produce up to 4.8 million seeds per season.<sup>1</sup>

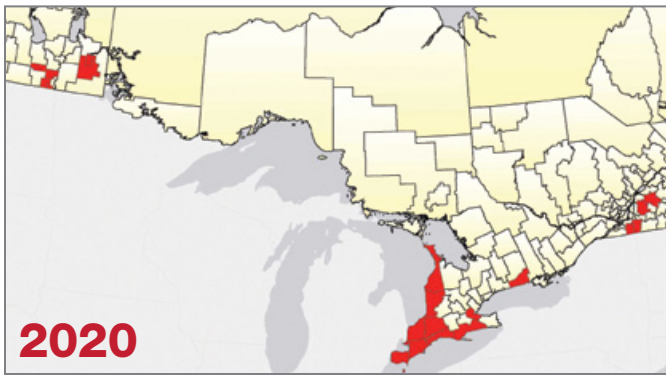
**6**

Waterhemp has evolved resistance to 6 modes of action.<sup>2</sup>

**2.5**

A plant can grow up to 2.5 cm per day.<sup>2</sup>

## Distribution of waterhemp in Canada.



Source: K. Obied, P. Sikkema, C. Willemse, N. Langdon, D. Westerveld, M-J. Simard, M. Laforest, D. Miville and T. Jones.

## Smaller weeds = bigger results.













Early weed control is crucial. There is only one growing point to control on germinating waterhemp, whereas a 6-inch tall plant can have as many as 30 growing points. Therefore, contact herbicides must come in contact with most growing points to have adequate control of the weed, so good coverage is critical to ensuring effective weed control.



**6" waterhemp:**  
**>30 growing points**

**4" waterhemp:**  
**14-20 growing points**

**2" waterhemp:**  
**7-9 growing points**

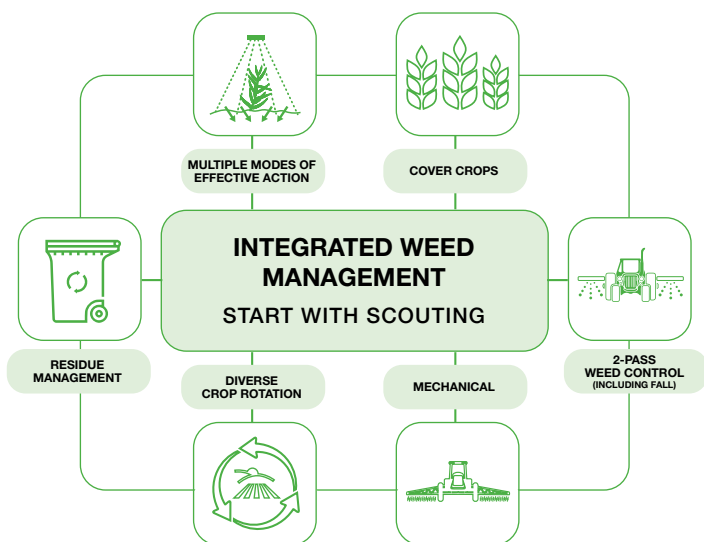
Waterhemp	Redroot Pigweed	Green Pigweed	Palmer Amaranth
			
Hairless, lanceolate leaves	Ovate leaves with short dense hairs	Arrowhead shaped leaves	Hairless diamond/oval shaped leaves
			
Long, narrow, shiny	Short, dull broad leaves	Few hairs	Extended petiole
			
Hairless stem	Hairy stem	Sparse, short hairs	Hairless stem

### Sources:

1. Bruce Ackley, The Ohio State University, Bugwood.org.
2. Phil Westra, Colorado State University, Bugwood.org.
3. Rebekah D. Wallace, University of Georgia, Bugwood.org.
4. BASF.
5. Howard F. Schwartz, Colorado State University, Bugwood.org.

# Take control of waterhemp in your field.

## An integrated weed management strategy against waterhemp.



## Tips for managing waterhemp:

1. Start clean, use an effective burndown or tillage to control emerged weeds
2. Use multiple modes of effective action
3. Use high water volumes
4. Apply timely post-emergence herbicide treatments before weeds exceed the maximum size for control

## BASF solutions for managing waterhemp.

	Glyphosate-tolerant corn	Glyphosate-tolerant soybeans	Dicamba-tolerant soybeans	Liberty®-tolerant soybeans	Enlist E3™ soybeans	Conventional/IP soybeans
Pre-plant/ Pre-emergence	Integrity or Zidua SC + Marksman® herbicide <sup>3</sup>	Zidua SC + Eragon® LQ herbicide or Integrity or Optill® herbicide	Zidua SC + Engenia® herbicide + Eragon LQ or Integrity or Optill	Zidua SC	Zidua SC	Zidua SC (check with your grain buyer) <sup>4</sup>
Post-emergence	Marksman <sup>3</sup> + Armezon® PRO herbicide or Zidua SC	Zidua SC	Engenia (up to 2nd trifoliolate)	Liberty® 200 SN herbicide or Zidua SC	Liberty 200 SN or Zidua SC	Zidua SC (check with your grain buyer) <sup>4</sup>
Pre-harvest	-	Eragon LQ	Eragon LQ	Eragon LQ	Eragon LQ	Eragon LQ
Post-harvest	-	Distinct® herbicide	Distinct	Distinct	Distinct	Distinct

<sup>1</sup> Source: Hartzler et al., "Effect of common waterhemp (*Amaranthus rudis*) emergence date on growth and fecundity in soybean," *Weed Science* 52:242-245, 2004.

<sup>2</sup> Source: United Soybean Board, "Take Action: Herbicide Resistance Management: Waterhemp management in soybeans," <https://iwilltakeaction.com/weed/common-waterhemp>.

<sup>3</sup> Can only be applied once per season.

<sup>4</sup> BASF is in the process of establishing import tolerances (maximum residual limits (MRLs)) for markets around the world. Talk to your grain buyer before applying to conventional or IP soybeans.

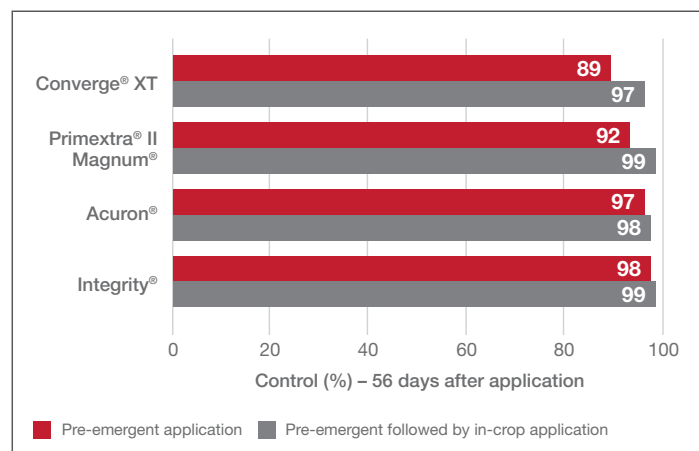
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## Resistant waterhemp control in corn.



Source: L. Benoit, C. Willemsse, University of Guelph, n=5.

## Zidua® SC herbicide is the foundation of waterhemp control.



Source: BASF, Ontario, 2017.