

IMI Resistant Weeds

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Group 2 herbicides, the ALS inhibitors, encompass 4 herbicide families in used Western Canada, including the imidazolinones. Other group 2 herbicide families include the sulfonylureas, the sulfonamides and the triazolopyrimadines. Herbicides belonging to these families are listed in Table 1 below.

Table 1. Group 2 families and associated herbicides registered for use in Western Canada.

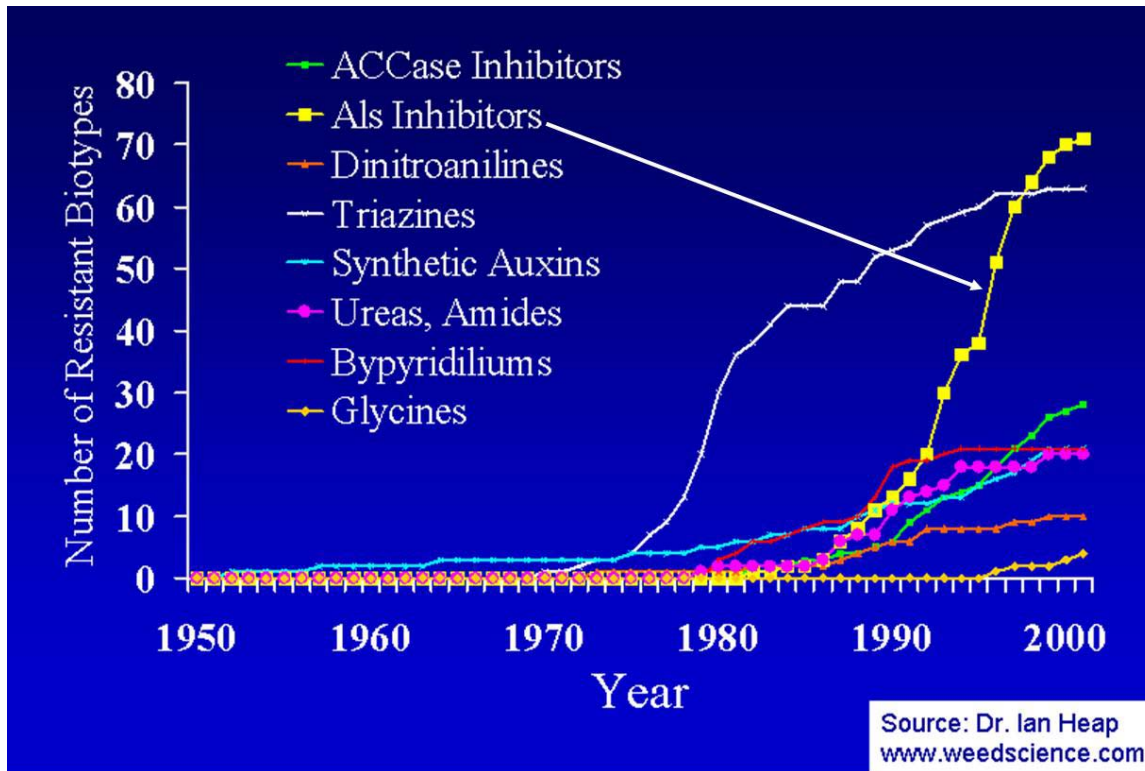
Herbicide Family	Herbicide
Imidazolinone	Absloute Adrenalin Assert Odyssey Pursuit Solo
Sulfonylurea	Accent Ally Escort Express Muster Option Prism Refine Extra Sundance Triton Ultim Unity
Sulfonamides	Everest K2
Triazolopyrimadines	Frontline Specturm Prepass Trophy

All of the above herbicides have a common site of action and are therefore grouped together as ALS inhibitors or Group 2 herbicides. ALS (acetolactate synthase) is an essential enzyme in the production of the branched-chain amino acids valine, leucine and isoleucine. With the inhibition of ALS the affected plant essentially halts growth and eventually dies.

The Group 2 herbicides are an important class of products, and have found extensive use in cereal, oil seed and pulse production in Western Canada. Because of this wide spread adoption we are now seeing resistant weed species evolving.

Globally Group 2 resistance has evolved at an alarming rate. See Fig. 2 below

Figure 2. Global occurrence of herbicide resistant biotypes (weed species by herbicide group)



Group 2 weed resistance appears to be evolving faster (species by herbicide) than any other previously documented herbicide group. There are a number of reasons for this. Group 2 herbicides are highly effective and exert a high selection pressure towards resistance. Also there are a number of known mutations in the ALS enzyme that will confer resistance, and therefore the chances of having an initial rare resistant biotype in your field may be higher than for other herbicide groups. Many of the Group 2 herbicides have residual properties and the extended weed control period serves to increase selection pressure. And finally we are simply using more group 2 herbicides in our crop rotations. Many western Canadian farmers have switched to group 2 products (Everest, Assert, and Sundance) to control Group 1 resistant wild oat. With the introduction of IMI tolerant crops such as Clearfield canola, Clearfield wheat and soon Clearfield lentil and sunflowers we could see even higher uses of these products.

Currently in western Canada we have at least 11 species of weeds that have evolved resistance to a Group 2 herbicide (2 grasses and 9 broad-leafed). In Manitoba it is estimated that over 90% of the kochia populations are resistant to ALS inhibitors.

The ALS inhibitors, including the IMI's are very valuable and effective products. Producers are going to have to practice IWM to preserve the use of these products. Proper crop and herbicide rotations will need to be implemented if Group 2 products are to remain viable in western Canada.