

IMAZETHAPYR—AN IMIDAZOLINONE HERBICIDE FOR LEGUMINOUS CROPS

E.M. Lignowski, M.E. Jackson, and D.L. Shaner
American Cyanamid Company, Agricultural Research Division
Princeton, New Jersey 08543-0400 USA

Abstract. Imazethapyr (Pursuit* herbicide), an imidazolinone herbicide which can be applied pre-emergence or early post-emergence, is being developed for use in several leguminous crops in Australia.

When applied to soil, imazethapyr is absorbed into the plant root cells, through the mechanism of ion trapping, and is translocated to the growing points of the shoot, primarily via the transpiration stream. Tolerant leguminous species rapidly metabolize imazethapyr to non-toxic compounds whereas susceptible weed species, e.g., *Amaranthus*, cannot rapidly detoxify imazethapyr and are easily controlled.

For most weed species, imazethapyr has optimum post-emergence activity when applied to upright weeds 2.5 to 7.5 cm tall or prostrate weeds with 1 to 3 leaves. Foliar applications of imazethapyr require the presence of a surfactant for maximum leaf absorption. In order for imazethapyr to be herbicidally active after foliar application, it must be translocated from the leaf to the growing points. Tolerant species that rapidly metabolize imazethapyr do not translocate as much of the compound as susceptible species.

Soil type and environmental conditions at and after pre-emergence and early post-emergence applications can influence herbicidal performance by affecting bioavailability, uptake and translocation of imazethapyr.

Imazethapyr has been tested in the key growing areas in Australia for the past four years and has shown considerable promise for weed control in grain legumes. Tolerant crops include field peas, faba beans, soybeans and peanuts. Individual crop tolerance varies somewhat with application type and environmental conditions. Pasture legumes, such as subclovers and lucerne, appear tolerant to imazethapyr applied post-emergence.

Imazethapyr applied pre-emergence or early post-emergence at 50 to 100 g a.e./ha will control the following winter weeds: deadnettle, *Lamium amplexicaule*; Indian hedge mustard, *Sysimbrium orientalis*; shepherd's purse, *Capsella bursa-pastoris*; spiny emex, *Emex australis*; stagger weed, *Stachys arvensis*; stinging nettle, *Urtica incisa*; toadrush *Juncus bufonis*; wild turnip, *Brassica tournefortii*; and yellow burrweed, *Amsinckia intermedia*. Certain susceptible weed species, such as common sowthistle, *Sonchus oleraceus*; prickly lettuce, *Lactuca serriola*; soursob, *Oxalis pes-caprae*; threehorn bedstraw, *Galium tricornutum*; wild radish, *Raphanus raphanistrum*; and wireweed, *Polygonum aviculare* may not be completely killed by imazethapyr, but surviving plants remain severely stunted and are not competitive with the crop. Grass species, such as annual ryegrass, *Lolium rigidum*; barley grass, *Hordeum leporinum*; and wild oat, *Avena fatua*, will be suppressed for 10 to 13 weeks after application but may require a post-emergence grass herbicide rescue treatment. Rough poppy, *Papaver hybridum* and certain leguminous weeds are tolerant to imazethapyr at 100 g a.e./ha.

*Trademark of American Cyanamid Company, Wayne, New Jersey, USA