Pesticide Use Delivers Great Value in Preventing Losses to Invertebrate Pests in Australia’s Grain Crops

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With exports in excess of $6 billion each year and over 15 million ha planted annually, the grains industry is one of the largest primary industries in Australia. Controlling invertebrate pests such as insects and mites is a priority for Australian grain growers since these pests cause both direct and indirect damage to crop yields—direct through their feeding and indirect through transmission of diseases. Invertebrate pest control in Australia has relied on chemical applications and host plant resistance for over 100 years. In addition, cultural controls such as conservation of natural enemies, time of sowing, crop destruction, crop rotation, weed management and cultivation are available for some invertebrate pests.

Recently, the Australian Grains Research and Development Corporation requested a study of the present and potential costs of invertebrate pests to assist in the allocation of resources for pest management [1]. A 2011 survey of entomologists was conducted for the six most important Australian grain crops: wheat, barley oats, canola, lupins and grain sorghum. The selected crops had a mean gross production value of $8.0 billion. The survey provided data on the incidence and severity of 29 invertebrate pest groups across the six crops. This data was combined with crop production data to estimate the potential and present losses in the northern, southern and western production regions of Australia.

Pests of economic importance are relatively uniform across the cereals—redlegged earth mite, blue oat mite and locusts being the most important. Redlegged earth mite is also an important pest of canola and lupins. Other canola pests include diamondback moth and various aphids, while various aphids and budworms are the most important lupin pests.

Aggregated across the six crops, the potential crop losses to invertebrate pests without chemical or cultural controls were estimated at $1.7 billion, or 21% of total current production [1]. For each pest group, data was collected on the proportion of pest area treated with cultural controls and the proportion of pest area treated with pesticide. Present cultural and pesticide controls of invertebrate pests effectively reduce losses down to an estimated present annual loss totaling $360 million (4% of total production). Current cultural and chemical controls are estimated to prevent $1.3 billion in potential losses.

Aggregated across all pests in the six crops, cultural control methods deliver benefits totaling $254 million [1]. Despite the contribution of cultural controls, many of the invertebrate pests regularly require intervention for their management, and this intervention is invariably pesticide-based. Pesticide treatment costs across the six crops totaled $159 million preventing $1 billion in crop losses. Thus, Australian grain crop growers gain $6.3 for every $1.0 spent on pesticides to control invertebrate pests.

Invertebrate pests represent a major threat to grain production in Australia with the capacity to greatly decrease the value of the industry. Invertebrate pests are generally well managed at present and the industry is highly reliant on broad-spectrum pesticides to achieve this control [1].

**References**