19. Herbicide Tolerant Potato

Potato is a slow growing crop that offers little competition for weeds. In the Pacific Northwest, where approximately half of the annual U.S. potato crop is produced, the most common and troublesome weed species include both grasses and broadleaves. Lambsquarters, pigweed, nightshade, and barnyardgrass each infest an estimated 90% of northwest potato acreage, and each can potentially cause 20% – 30% yield loss if not controlled.

The primary weed control practice in Northwest potato fields is a combination of cultivations and timely hilling plus one or more herbicide applications. Over 90% of Pacific Northwest potato acreage is treated with herbicides, and typically two active ingredients are applied per acre. Metribuzin is applied to the majority of acres and provides pre-emergence control of many broadleaf and grass weeds. However, metribuzin efficacy on certain weeds, such as nightshades, is declining as weed populations develop resistance. Weeds for which metribuzin is not effective are targeted with other pre-emergence herbicides such as EPTC, metolachlor, pendimethalin, trifluralin, and rimsulfuron. Post-emergence use of herbicides in potatoes is limited because of risk of phytotoxicity to the crop. In addition, available post-emergence herbicides are ineffective against many weeds which are troublesome, particularly nightshade species and perennials such as Russian thistle. As a result, approximately 2% of Northwest potato production is lost annually to uncontrolled weeds.

Glyphosate tolerant potato varieties have been developed through the insertion of genetic material from a soil bacterium into the potato genome and have been field-tested. Preliminary data show the potential for providing Northwest growers an effective tool for post-emergence weed management without risk of crop damage. In a glyphosate resistant potato system, growers could continue with current practices for pre-emergence weed management, and supplement them with a post-emergence glyphosate application for more complete weed suppression.

Potential Impacts of Herbicide Tolerant Transgenic Potato
Change in Production: 500 million lbs/yr annual increase
Change in Pesticide Use: 465,000 lbs/yr increase in herbicide use
Change in Revenue: $6 million/yr net increase

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