

## Herbicide Registration of Vegetables

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**Background:** Herbicides are a critical piece of any integrated pest management program. Having as many effective tools as possible is good for weed control and resistance management. For many different reasons discussed in this paper and described in the presentation, there are challenges that must be addressed by registrants in bringing effective and affordable herbicides to the market for the vegetable industry. The presentation will focus on the costs and regulatory hurdles that must be successfully navigated to register and bring to market a herbicidal product. It will also address the specific challenges related to adding vegetable crops for a herbicide.

**Registering a new Active Ingredient.** Most R&D companies screen many molecules before deciding to develop and register one for sale. A tremendous amount of work and money goes into research. It is estimated that R&D companies spend over 7% of their sales just on R&D and certainly very few actually make it as candidates for products and even fewer through the regulatory and development process to become registered. A new product takes 8-9 years to bring to market and can cost close to \$200 million dollars. The presentation will describe and illustrate the typical flow of activities a basic manufacturer must go through to bring a product successfully to the market.

**Registration in California.** Once you successfully navigate and generate all the data necessary to obtain a registration from the U.S. Environmental Protection Agency (EPA), you must still obtain registration from the California Department of Pesticide Regulation (CDPR). There are some California specific data requirements that are necessary before a CA registration can be obtained. While most of these data may be generated through the standard development and registration process, some are unique to California and can add to the typical cost of registering a product. In recent years, CDPR has been working with US EPA to do concurrent reviews or even do some reviews for EPA to allow for products to receive simultaneous approval or at least receive CA approval pretty quickly after US EPA approval so that California growers don't have the long delays they have had in the past in gaining access to new tools. There is still progress that can be made on this front but things have improved.

***Registering Vegetable Uses.*** Most R&D companies when considering to develop and register a new herbicide look to large acre crops first to see if they can recover their investment –soybeans or corn for example. It usually isn't until later in the marketing and development plan that they consider expansion into vegetable crops. There are many factors that must be considered when adding a new use to any label but vegetable crops bring some unique considerations especially for herbicides. A company must consider the technical fit -will the product control the weed spectrum in the vegetable crop. Are their unique features of the soil type of vegetable growing practices the influence the effectiveness of the herbicide for example? Can the company recover an acceptable return on its investment? What about crop safety? What about plant back issues since vegetable crops often have shorter growing seasons the grower is likely to rapidly plant back to another crop. Will the herbicide affect the follow on crop? Often smaller companies, organizations like IR-4 or commodity groups can assist with the generation of data necessary to register on vegetable crops – many times considered minor crops.

***Other Issues to Consider.*** In addition to deciding about whether to register a product for use on vegetables, companies must consider the stewardship and development that is unique to a herbicide used on high value specialty vegetables. Things like weed spectrum, crop safety, residual in soil with respect to plant back, crop groupings versus individual crops, the rapid development of cultural varieties, all the possible tank mixes, etc. Additionally, companies must consider their ability to protect their investment through data protection.