

Innovations for weed management – From new herbicide modes of action to novel technologies for weed management

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Summary Chemical weed control is currently the method of choice for provision of efficient weed management in broadacre crops. For decades the introduction of novel small molecules with improved efficacy as well as ecological and economic properties has been the key for the delivery of systems that can be readily integrated into modern agricultural practices. One driver for the selection of new molecules is the rapid evolution of weed resistance to herbicides and therefore there is increasing need for herbicides with novel modes of action. Understanding the basis for mode of action therefore allows the development of useful properties associated with novel molecules and thus new applications.

Current status and progress in determination of herbicide mode of action to identify the relevant target(s) out of a massive number of potential target sites will be presented. Our findings suggest that a structured approach using large data sets, data analytics and automatization has paved the way for straightforward determination of herbicide mode of action. Key technological trends will be reviewed and examples presented to describe how these technologies drive practice change in agriculture. Novel chemistry thus enables the development of new agronomic practices, based on informed decision making with less input, higher efficacy and the production of better products for a more sustainable agriculture.

Keywords Mode of action, weed management tools, data analytics, automatization.