

Herbicide Discovery and Commercialization in the Context of Herbicide-Resistance Management

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Agronomic crop production started with the selection and domestication of plant species possessing desired characteristics. Some of the non-domesticated plant species continued to grow, naturally evolve as the habitat was altered to nurse the domesticated species and compete with crops for the resources reducing the yield. Tillage and hand weeding became an important practice in crop production due to an unending war with weed species. The traditional methods of weed control were not only difficult, time consuming back-breaking physical burden but also less effective, uneconomical and complicated by the uncertain weather conditions. Herbicides revolutionized the crop production by providing easy, quick, highly effective and economical weed control.

Herbicides improved the crop yield by facilitating the adoption of better agronomic practices including narrow planting, fertilizer responsive high yielding dwarf crop cultivars, and fertilizers etc. Herbicides played a major role in reducing the soil erosion and conserving moisture in the soil profile by making adoption of reduced- or no-till practices possible. The success and impact of herbicides in agriculture was further enhanced by the commercialization of herbicide-resistant crops. However, herbicides became a victim of their own success as the simplification of weed control led to a rapid increase in the number of herbicide-resistant weed species.

Currently more than 500 unique cases of herbicide-resistance have been documented and it is increasing. Loss of effective herbicide options due to an increase in the number of herbicide-resistance cases is further complicated by limited adoption of integrated weed management strategies and lack of herbicide-discovery in last three decades. In last few years more research and emphasis has been put on the integrated weed management including use of necessary tillage, incorporation of cover crops and harvest weed seed control. Similarly, there is a renewed interest in herbicide discovery and industry is heavily investing in the discovery of new herbicides with novel herbicide sites-of-action. New herbicides with novel

sites-of-action are desperately needed to play a central role in the modern integrated weed management that are based on diversity and precision to increase the productivity and profitability needed to feed the increasing populations while restoring sustainability.

FMC is dedicated to developing sustainable weed management solutions through its state-of-art research and development (R&D) capability and product support network engaged in novel herbicide discovery, commercialization, product renewal, and technical services to support growers. FMC has taken a lead in the discovery of new herbicide sites-of-action and strengthened its commitment to deliver innovative solutions to prevent and manage herbicide resistance.

References:

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