

Herbicide resistance – We figure out how growers adjust and what it means to cost of production

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Herbicide resistance of weeds represents a rapidly increasing challenge to producers of the world's most important grains. The International Survey of Herbicide Resistant Weeds in 2016 found 471 unique cases in 250 species of weeds in 87 different crops in 66 countries. Weeds have evolved resistance to 23 of the 26 known herbicide sites of action and to 160 different herbicides.

With increasing herbicide resistance, the question arises how it affects crop production and whether it could have an impact on cost of production and ultimately on profitability.

In a series of case studies on adjustment options initiated by agri benchmark, our partner Kelvin Leibold from Iowa State University shared concerns and methods of control being tested in the Midwestern U.S.

Based on existing general adaptation strategies, we compared the following four strategies to address herbicide resistance in corn and soybeans in the Midwestern U.S.

Base scenario: both crops were treated with two post-emergence glyphosate passes, resulting in herbicide costs of 25 USD/ha for corn and 23 USD/ha for soybeans.

Scenario A: With decreasing effectiveness of the base strategy, the first step farmers often take is to spray an additional pre-emergence herbicide and add a residual herbicide to the tank mixture of the first glyphosate spray. This increases the herbicide costs by 57 USD/ha for corn and 62 USD/ha for soybeans. Due to the additional spraying trip, the operating cost would increase by 18 USD/ha.

Scenario B: If the combination of glyphosate, residual herbicide and pre-emerge herbicide is not sufficient anymore, farmers would substitute the glyphosate by glufosinate. This would increase the herbicide costs in corn by another 18 USD/ha and in soybeans by 22 USD/ha.

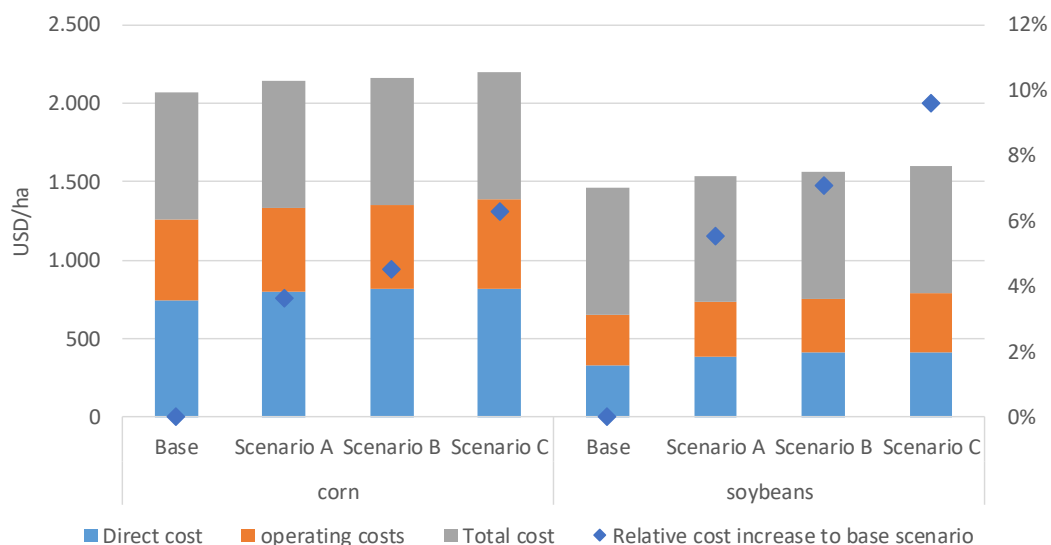
Scenario C: If the combination of glufosinate plus pre-emergence selective herbicides loses effectiveness, farmers would need to add tillage. This would increase the operating cost by 37 USD/ha.

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Figure 1: Increase of production cost by different herbicide strategies



Sources: agri benchmark data

agri benchmark’s digging deeper reveals that just relying on changes in the chemical treatment leads to some moderate increases in cost of production. However, once growers move to additional tillage passes, it becomes expensive to them, and ultimately, to the society. Plus, the any attempt to reduce greenhouse gases will be jeopardized.