

Bayer AG

Super weeds blight Bayer's hopes for Monsanto

Blockbuster herbicide Roundup has brought legal trouble — and now plants are showing growing resistance to glyphosate



Palmer amaranth is one of 43 weed species that have developed resistance to the crop chemical glyphosate © Dreamstime

Gregory Meyer in New York 3 HOURS AGO

David Nichols used to wait until his soybeans had sprouted and then apply a shot of Roundup, the blockbuster herbicide produced by Germany's Bayer.

Now, before planting seeds, the farmer has to douse his soil with a tankful of chemicals to keep the weeds under control.

Since last June, when Bayer acquired Roundup via its \$63bn purchase of US seeds and chemicals group Monsanto, it is the associated [legal liabilities](#) that have rocked the German group.

Two US juries have awarded more than \$100m to plaintiffs over claims that the weedkiller, which uses the chemical glyphosate, caused cancer. More than 13,000 similar lawsuits loom over Bayer, whose 300m gallons of annual glyphosate production supplies about half the \$5bn-\$6bn global market, according to estimates from Jonas Oxgaard, senior analyst at Bernstein Research.

Shares in Bayer have fallen by a third since the [acquisition](#). At the company's annual meeting last

month, there was an unprecedented “no confidence” vote in the management.

But there is another problem emerging for Bayer and its customers: Roundup is not working like it used to.

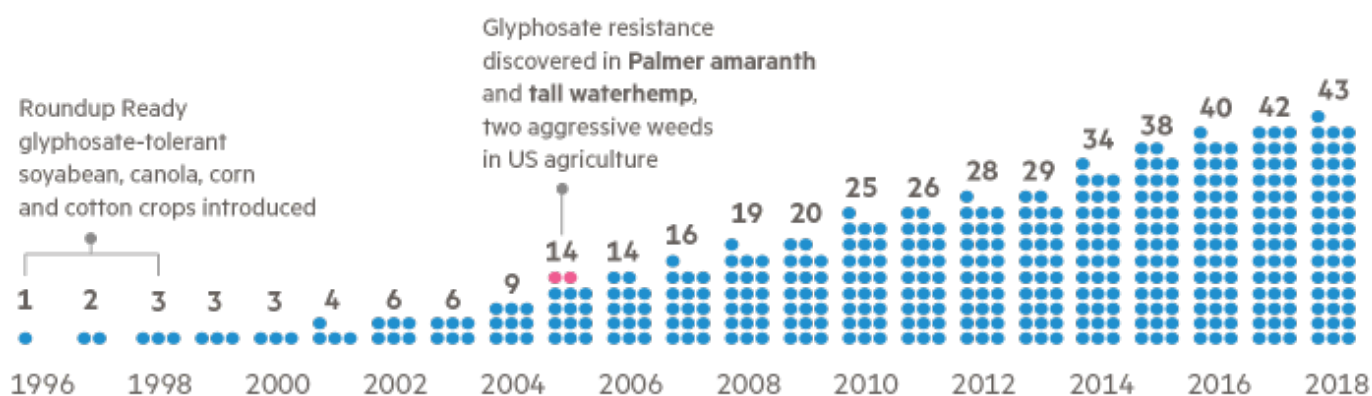
“We were relying solely on glyphosate. It was doing a real good job for us,” said Mr Nichols, who farms near the Mississippi river in western Tennessee. “We probably overused that herbicide, and now we’ve got full-blown resistance to glyphosate.”

Mr Nichols’s 3,600-acre farm has been invaded with a pigweed called Palmer amaranth, one of 43 weed species worldwide to have developed resistance to glyphosate since 1996, according to the International Survey of Herbicide Resistant Weeds. Where his pre-planting chemical cocktail fails, he is forced to uproot 6ft amaranth stalks with his hands.

Weeds outrun Roundup

Number of species resistant to glyphosate

Each ● represents one species



Source: International Survey of Herbicide Resistant Weeds

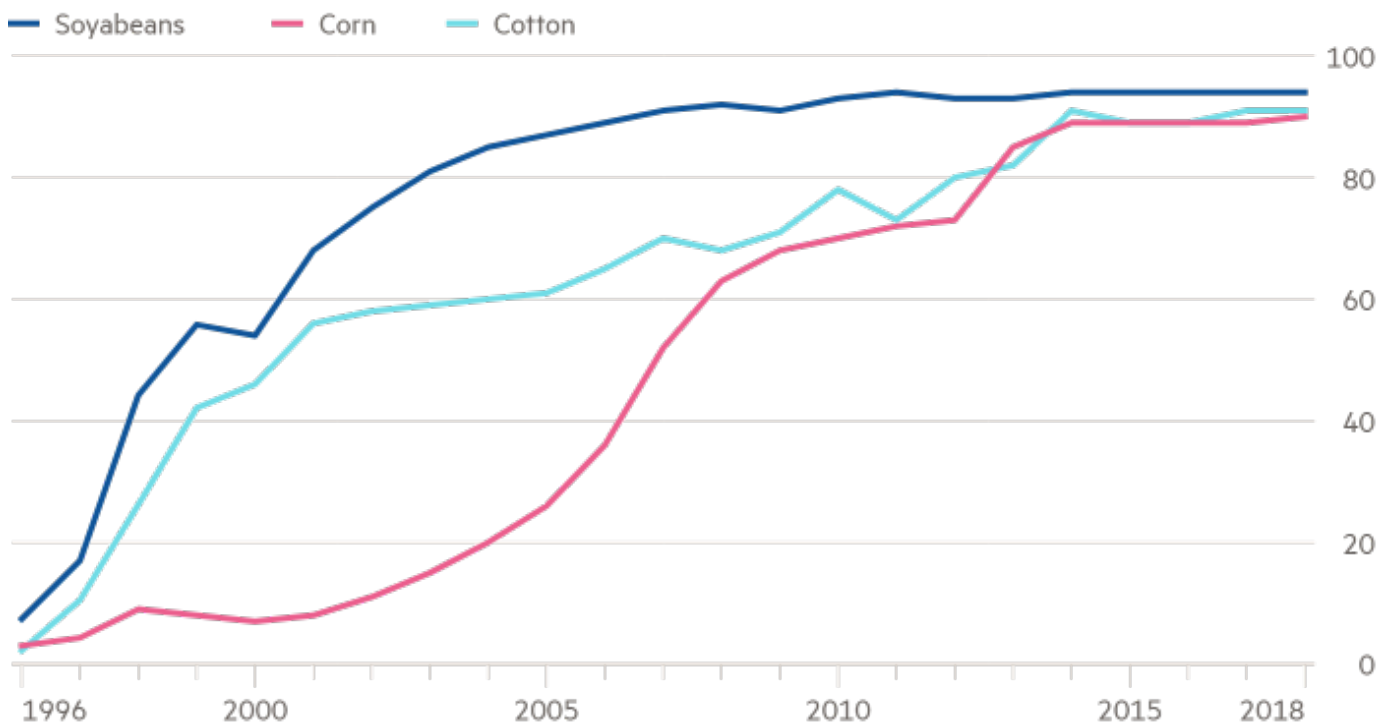
© FT

Introduced in the 1970s, glyphosate took off in the 1990s after Monsanto genetically engineered “Roundup Ready” soyabeans, canola, corn and cotton plants able to withstand the chemical as it went to work destroying weeds. Glyphosate brought environmental benefits as farmers could burn less fuel with fewer trips into fields, reduce the use of pesticides and harsher herbicides and stop ploughing, which erodes topsoil.

“Glyphosate in particular helped really allow the adoption of no-till practices, which has a lot of positive environmental aspects to it. But it also then became something that growers relied upon,” said Greg Elmore, Bayer’s North American crop protection lead.

Biotech crops with herbicide tolerance dominate US farms

% of acres planted by year



Source: USDA

© FT

Weed resistance grew as farmers leaned too heavily on one herbicide. Natural selection enabled a tiny minority of weeds with ingrained resistance to survive and eventually proliferate. By the early 2000s, many US farmers were almost entirely dependent on glyphosate to protect crops of corn and soyabeans, which are typically planted on the same ground.

“There’s a whole generation of farmers that in agriculture are referred to as ‘Roundup babies’,” said Ricardo Salvador, director of the food and environment programme at the Union of Concerned Scientists, an advocacy group. “If you wanted to run a nursery where you specifically made weeds resistant to a particular herbicide, you would do what has been done in large swaths of US agriculture: every year you would expose that weed population to the same herbicide.”

A single Palmer amaranth weed can grow three inches a day and sprout 1m seeds atop a stem thick as a forearm. Originally from the desert south-west, its range will push into Canada and Europe as temperatures rise due to climate change, according to [research](#) from Erica Kistner and Jerry Hatfield of the US Department of Agriculture.

Some weeds have built defences against multiple herbicides, making them even harder to manage. In one central Illinois field, researchers found a pigweed species resistant to five different classes of herbicide, one of which had never been used there, said Aaron Hager, professor in the University of

Illinois's crop sciences department.



Tennessee farmer David Nichols says: 'We probably overused that herbicide, and now we've got full-blown resistance to glyphosate.' © Karen Pulfer Focht

"If your solution to resistance is to open up a new jug, we're rapidly running out of jugs," Prof Hager said.

As farmers battle glyphosate resistance, Monsanto has developed cotton and soybeans with genetic traits able to tolerate both glyphosate and dicamba, another herbicide, allowing farmers to toggle between weedkillers. "As resistances have developed in these [weed] species, farmers are moving to other modes of action that do effectively work," Mr Elmore said.

Dicamba is decades old and more volatile than glyphosate, however, sometimes drifting across fencelines to harm neighbouring crops. Glyphosate's success led to a freeze in investment in newer types of herbicide.

"When Roundup Ready came and fundamentally changed the marketplace, a lot of primary manufacturers stopped funding their herbicide discovery efforts and put it into different areas. And you don't just flip a switch and start this again," Prof Hager said.

Bayer maintains that glyphosate is safe when properly used, a position [reaffirmed](#) by the US Environmental Protection Agency last week. Mr Elmore acknowledged that more weed species are resisting glyphosate, but he said it remained a useful component of a comprehensive weed management strategy. Bernstein's Mr Oxgaard said some farmers have reacted to resistance by using even more glyphosate.

[Take Action](#), a farmer education campaign backed by Bayer and other crop inputs companies, recommends a diverse approach that includes starving weeds of sunlight by planting crops in narrow rows, planting cover crops on fields and dense grass on field borders and carefully cleaning farm machinery to remove weed seeds.

Using Roundup alone was “the easy button” and in hindsight a mistake, said Mr Nichols. The need for several kinds of weedkiller has raised his costs even as soyabean prices are depressed by tariffs in China, the biggest export customer.

“Right now, in today’s ag economy, we’re faced with real tight margins,” he said. “It’s really difficult to manage that.”

[Copyright](#) The Financial Times Limited 2019. All rights reserved.