

## Monsanto's Roundup Toxic to Microorganisms Crucial to Healthy Soil

Roundup is toxic to a soil fungus at doses well below recommended agricultural dilutions, according to a 2016 scientific study published in the journal *Environmental Science and Pollution Research*.

The study was conducted on a soil filamentous fungus, *Aspergillus nidulans*, which the researchers used as a marker of the health of agricultural soils.

The dose that caused 50% mortality of fungus (LD50) corresponded to a dilution 100 times less than that used in agriculture - an environmentally relevant dose. At a dose 50 times lower than the agricultural application rate, mortality climbed to 100%.

The commercial formulation of Roundup proved to be much more toxic than glyphosate alone, highlighting once again that the additives are not inert and must be taken into account in the evaluation process.

At the LD50 and lower doses, the effects of Roundup were multiple and included impaired growth and cell disturbances, especially at the level of energy and respiratory metabolism. The new analysis highlighted a new mode of action of Roundup on energy metabolism different from that observed previously in animal cells.

### Microorganisms crucial to healthy soil

Microorganisms such as fungi are crucial to healthy soil. Since Roundup is the most widely used herbicide in the world, soil microorganisms in many areas will be exposed to it.

The new study was carried out as part of a participatory research project called Institutions-Citizens Partnership for Research and Innovation (PICRI). It was conducted by a team of researchers led by Christian Vélot, a lecturer and researcher in molecular genetics at the University Paris-Sud, France.

The team studied the effects of a commercial formulation of Roundup called GT Plus, containing

450 mg/L of glyphosate (the stated active ingredient).

The researchers concluded that the toxic effects of the glyphosate-based herbicide on soil filamentous fungi, and thus potential impairment of soil ecosystems, may occur at doses far below the recommended agricultural application rate.

The findings are relevant for farmers who wish to improve the health of their soils.

Energy metabolism and respiratory disturbances were detected at a dose for which there is no effect visible with the naked eye (NOAEL = No Observed Adverse Effect Level). This implies that pesticide residues may cause effects at exposure levels for which there is no visible toxic effect, such as residues in GM herbicide-tolerant crops.

### 'Substantial equivalence' of Roundup-ready crops in question

"Such metabolic disturbances could affect the composition and thus jeopardize the safety of food from these plants", says Christian Vélot.

"These data are likely to call into question the principle of substantial equivalence, on which the evaluation of all agricultural GMOs in the world is based, and which is used to declare that foods derived from a GM plant are as safe and nutritious

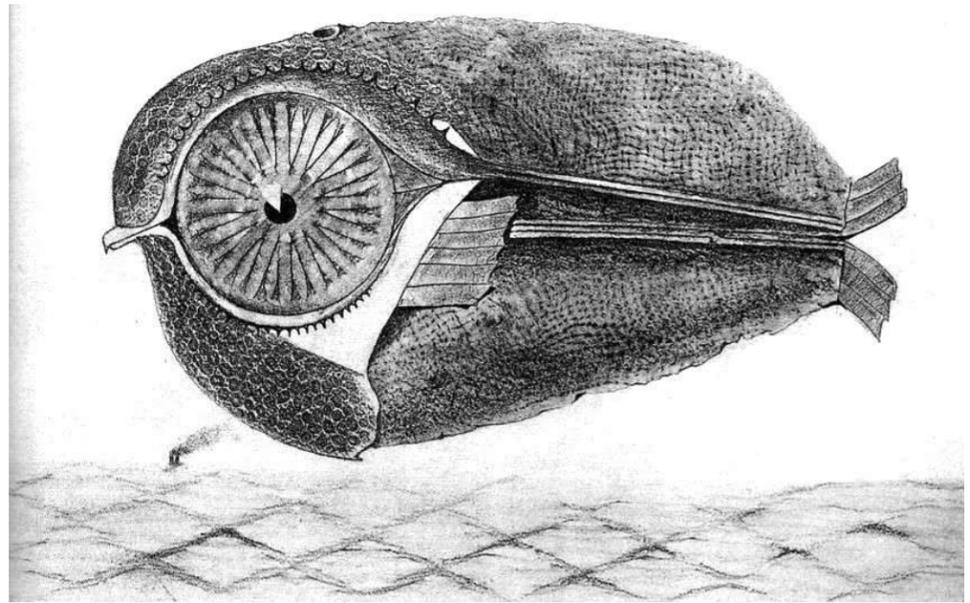
as those from the corresponding conventional plant.

"Since this principle relates to food (that is to say, the end of the chain), it should also take into consideration the conditions experienced by the plant. But a plant tolerant to a herbicide has not experienced the same conditions as its conventional counterpart, since the former is sprayed with herbicide that can accumulate in its cells.

"Surprisingly, in the case of GM Roundup-tolerant plants (80% of agricultural GMOs), substantial equivalence does not take into account any effects due to the presence of the herbicide and its residues. Our studies show, however, the point at which it would be appropriate to take these aspects into consideration - the interaction of the chemical herbicides with respiratory and energy functions that can cause severe malfunctions of the general metabolism."

**These results reinforce the concerns expressed by civil society on the weaknesses and deficiencies of GMO and pesticide approvals.**

**Claire Robinson.**  
[www.criigen.org](http://www.criigen.org)



## Court Awards Oil and Gas Company & Calls for Disciplinary Action Against Attorney

The United States District Court for the Western District of Pennsylvania issued an order imposing sanctions on two attorneys defending a Community Bill of Rights Ordinance adopted by Grant Township, Pennsylvania. The Township has spent years fighting to stop frack wastewater injection wells from being sited in the community with assistance from the Community Environmental Legal Defense Fund (CELDF).

Injection wells – which involve the high pressure underground dumping of millions of gallons of frack wastewater, which contains toxins, carcinogens, and other chemicals – cause earthquakes, can contaminate drinking water, and bring other environmental and public health impacts.

Today's ruling comes as part of a lawsuit in which Pennsylvania General Energy, LLC (PGE) is suing Grant Township to overturn the Township's ban on frack wastewater injection wells. (*Pennsylvania General Energy Company, LLC v. Grant Township*)

Not satisfied with suing the community and questioning its authority to protect the people and environment of Grant Township from injection wells, the company decided to punish its lawyers by seeking monetary sanctions against them.

**"At a time when Americans more and more are looking to the courts for reason and justice, today we find neither, as corporate forces once again have been able to wield our institutions of government to punish those working to elevate the rights of communities over fossil fuel corporations,"** stated CELDF's Associate Director Mari Margil.

Magistrate Judge Susan Baxter earlier found that the Township's prohibition on injection wells violated the corporation's constitutional rights. The case is scheduled for a jury trial in May, at which PGE will seek hundreds of thousands of dollars from the Township, claiming that it suffered harm because the company has been prevented from dumping frack waste in a residential area next to the Township's sole source of drinking water.

**Mari Margil**  
[celdf.org](http://celdf.org)



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