

## FAQs on glyphosate and Parkinson's - October 2023

### 1. What is Parkinson's Disease?

Parkinson's is the fastest growing neurological condition in the world<sup>1</sup>, with over 10 million diagnoses globally – a number that is expected to double over the next 50 years. There is no cure. The cause is unknown but people with a family history of the disease have a higher risk. Exposure to air pollution, pesticides and solvents may also increase risk.

Parkinson's occurs when brain cells that make dopamine, a chemical that coordinates movement, stop working or die. It is a progressive condition - the 3 main symptoms being tremor (shaking), slowness of movement and rigidity (muscle stiffness). Other symptoms include mental health disorders, impaired mobility, sleep disturbance, mood and cognition issues, autonomic dysfunction, and a markedly decreased quality of life. Further information on Parkinson's can be found [here](#).

### 2. What is the relationship between pesticides and human health?

There is increasing evidence of a relationship between exposure to pesticides and Parkinson's, Alzheimer's, various types of cancer, lung disorders, reproductive problems and immunity problems.

Pesticides are often used in combination and these pesticide cocktails are likely to cause more damage to biodiversity and health than single agents. However, little research has been carried out, and these cocktails are not considered in the authorization of pesticides. The current authorization rules for pesticides are not sufficient to properly estimate the risk of brain diseases such as Parkinson's.

### 3. What is glyphosate?

Glyphosate is the most widely used pesticide in Europe and represents one third of all herbicides used<sup>2</sup>. Global use of glyphosate in agriculture was 746,580 t in 2014, representing 18% and 92% of all pesticide and herbicide use globally, respectively.

It is used for a wide range of applications such as weed control, termination of cover crops, termination of temporary grassland, crop desiccation as well as a harvest aid.

You can be exposed to glyphosate if you get it on your skin, in your eyes or breathe it in when you are using it. Glyphosate persists in the environment for days or months and many of us are exposed to glyphosate daily. It is associated with loss of biodiversity and bee mortality. In addition, there is growing evidence that the use of glyphosate poses risks to public health.

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<sup>1</sup> Dorsey ER, Sherer T, Okun MS, Bloem BR. The Emerging Evidence of the Parkinson Pandemic. *J Parkinsons Dis.* 2018;8(s1):S3-S8. doi: 10.3233/JPD-181474. PMID: 30584159; PMCID: PMC6311367.

<sup>2</sup> Antier, C. et al. Glyphosate use in the European agricultural sector and a framework for its further monitoring. *Sustainability* 12, 5682 (2020).

#### 4. What do we know of the link between glyphosate and Parkinson's?

There is growing evidence that glyphosate is a possible cause of Parkinson's disease<sup>345678</sup>. While this evidence is not conclusive, there is sufficient evidence to be extremely concerned that there is a so-called biologically plausible link between exposure to glyphosate and damage to the specific brain region involved in Parkinson's disease. A large number of studies have shown that farmers have a significantly increased risk of Parkinson's, and the same is true for residents living near agricultural plots.

#### 5. What is the European vote about and why is it important?

There have been major discussions on a glyphosate ban in Europe since 2015, when the International Agency on Research on Cancer of the World Health Organization, in an assessment of glyphosate, concluded that the compound was 'probably carcinogenic to humans'<sup>9</sup>. In subsequent assessments, the European Food Safety Authority and the European Chemical Agency concluded that glyphosate could not be classified as a carcinogen. Based on ongoing debates, the European Commission renewed the approval of glyphosate in 2017 only for an additional 5 years (further extended by one additional year in 2022).

On Friday 13 October 2023, a European vote was held to renew the approval of glyphosate's licence by 10 years. Representatives of EU countries had a chance to approve or block the draft regulation during a vote behind closed doors in the Standing Committee on Plants, Animals, Food and Feed (PAFF).

Since there was no sufficient majority – requiring 15 out of 27 member states and representing at least 65% of the total EU population – neither in favour or against the proposal, the EU executive has submitted the proposal to the appeal committee with the next crucial vote scheduled to take place on 16 November 2023.

This is therefore a real chance for Member States to request that the glyphosate EU licence is NOT renewed for 10 years as planned by the European Commission.

#### 6. What shortcomings does the current authorisation procedure suffer from?

There is broad consensus by the EFSA (European Food Safety Authority) and national and international Parkinson's experts that the current authorization policy provides a

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<sup>3</sup> Barbosa, E.R., et al., *Parkinsonism after glycine-derivate exposure*. *Mov Disord*, 2001. **16**(3): p. 565-8.

<sup>4</sup>Wang, G., et al., *Parkinsonism after chronic occupational exposure to glyphosate*. *Parkinsonism Relat Disord*, 2011. **17**(6): p. 486-7.

<sup>5</sup> Zheng, Q., et al., *Reversible Parkinsonism induced by acute exposure glyphosate*. *Parkinsonism Relat Disord*, 2018. **50**: p. 121

<sup>6</sup> Eriguchi, M., et al., *Parkinsonism Relating to Intoxication with Glyphosate*. *Intern Med*, 2019. **58**(13): p. 1935-1938,

<sup>7</sup> Caballero, M., et al., *Estimated Residential Exposure to Agricultural Chemicals and Premature Mortality by Parkinson's Disease in Washington State*. *Int J Environ Res Public Health*, 2018. **15**(12).

<sup>8</sup> Yang, A.M., et al., *Association between urinary glyphosate levels and serum neurofilament light chain in a representative sample of US adults: NHANES 2013-2014*. *J Expo Sci Environ Epidemiol*, 2023.

<sup>9</sup> Kudsk, P. & Mathiassen, S. K. Pesticide regulation in the European Union and the glyphosate controversy. *Weed Sci*. 68, 214–222 (2020).

wholly inadequate understanding of the risk of neurodegenerative disorders such as Parkinson's disease<sup>101112131415</sup>. This concern is based on the following shortcomings:

- The current assessment does not specifically address neurodegenerative diseases. Specifically, the current assessment with respect to potential neurotoxicity (i.e. damage to brain, spinal cord or nerves) is far too crude when it comes to assessing the risk of neurodegenerative diseases.
- The experiments to date do not take into account hereditary factors that may increase susceptibility after exposure to glyphosate.
- The dosage of glyphosate in the animal experiments used to date was too low and not representative of everyday life.
- The approval policy only assesses single pesticides and not cocktails. The reality is that farmers, gardeners and local residents are exposed to so-called cocktails<sup>16</sup>, which contain multiple pesticides. It is clear from authoritative recent scientific research that exposure to cocktails of different pesticides increases the risk of Parkinson's disease<sup>17</sup>.
- The experiments evaluated for glyphosate approval were conducted by the industry itself. Science journalists have discovered that industry omits relevant findings from the assessment dossier.

## 7. What is the precautionary principle and why is it important?

The precautionary principle states “if a product, an action or a policy has a suspected risk of causing harm to the public or to the environment, protective action should be supported before there is complete scientific proof of a risk.”

In recent decades it has become apparent that unforeseen negative effects occur due to the use of chemical pesticides, such as insect deaths and an increased risk of Parkinson's disease. That is why we call on Member States to ban them in the event of doubt or uncertainty about the possible harmful effects of pesticides on health or the ecosystem.

## 8. What are our recommendations?

- We request that the glyphosate EU licence is NOT renewed and Member States vote NO at the vote on the 16 November 2023
- We request that the EU supports independent research into glyphosate and similar type pesticides
- We request that [alternatives to glyphosate](#) be considered

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<sup>10</sup> EFSA, *Workshop on the EFSA NAMs project on environmental neurotoxicants*. 2022: Available upon request..

<sup>11</sup> Meerman, J., et al., *Neurodegeneration in a regulatory context: The need for speed*. *Curr Opin Toxicol*, 2023. 33:100383.

<sup>12</sup> van der Gaag, B.L., et al., *[Risk factors for Parkinson's disease: possibilities for prevention and intervention]*. *Ned Tijdschr Geneesk*, 2023. 167.

<sup>13</sup> Bloem, B.R. and J. Hoff, *De Parkinson Pandemie - een recept voor actie*. 2021: Poiesz.

<sup>14</sup> Dorsey, E.R. and B.R. Bloem, *The Parkinson Pandemic-A Call to Action*. *JAMA Neurol*, 2018. 75(1): p. 9-10.

<sup>15</sup> Heusinkveld, H., et al., *Gewasbeschermingsmiddelen en neurodegeneratieve ziekten: mogelijkheden om de toelatingsvereisten te verbeteren*, in *2021-0153*. 2021, RIVM: website

<sup>16</sup> Bailey, D.C., et al., *Chronic exposure to a glyphosate-containing pesticide leads to mitochondrial dysfunction and increased reactive oxygen species production in *Caenorhabditis elegans**. *Environ Toxicol Pharmacol*, 2018. 57: p. 46-52

<sup>17</sup> Yang, A.M., et al., *Association between urinary glyphosate levels and serum neurofilament light chain in a representative sample of US adults: NHANES 2013-2014*. *J Expo Sci Environ Epidemiol*, 2023.