

EXERTS FROM: AG CHEMICAL AND CROP NUTRIENT INTERACTIONS – CURRENT UPDATE

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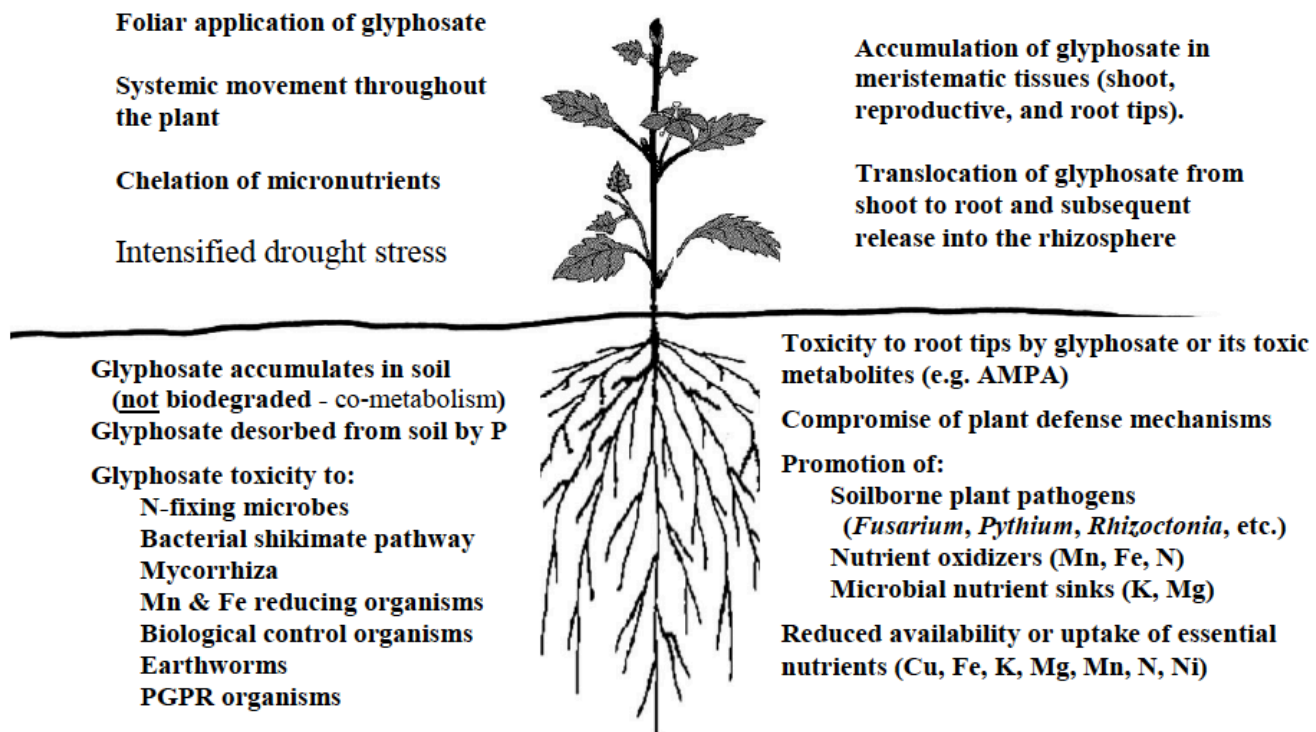
TABLE 1. Some things we know about glyphosate influencing plant nutrition and disease.

1. It is a strong metal chelator (for Ca, Co, Cu, Fe, Mn, Mg, Ni, Zn) – in the spray tank, soil and plant.
2. Rapid absorption by roots, stems, and leaves and systemic movement throughout the plant (normal and RR).
3. Accumulates in meristematic tissues (root, shoot and reproductive) of normal and RR plants.
4. Inhibits EPSPS in the Shikimate metabolic pathway and many other plant essential enzymes.
5. Increases susceptibility to draught and disease.
6. Non-specific herbicidal activity (broad-spectrum weed control).
7. Some of the applied glyphosate is exuded from roots into soil.
8. Immobilized in soil by chelating with soil cat-ions (Ca, Co, Cu, Fe, Mg, Mn, Ni, Zn).
9. Persists & accumulates in soil & plants for extended periods (years) – it is not 'biodegradable.'
10. Desorbed from soil particles by phosphorus.
11. Toxic to soil organisms facilitating nutrient access, availability, or absorption of nutrients.
12. Inhibits the uptake and translocation of Fe, Mn, and Zn at non-herbicidal rates.
13. Stimulates soilborne pathogenic and other soil microbes reducing nutrient availability.
14. Reduces secondary cell wall formation and lignin.
15. Inhibits nitrogen fixation.
16. Reduces Cu, Fe, K, Mg, Mn, and Zn in plant tissues and seed.
17. Residual soil activity can damage plants through root uptake.
18. Increases mycotoxins in stems, straw, grain, and fruit.
19. Reduces photosynthesis (CO₂ fixation).
20. Accumulates in root nodules to chelate Ni and inhibit N-fixation in legumes.

SUMMARY

Glyphosate is a strong, broad-spectrum nutrient chelator that inhibits plant enzymes responsible for disease resistance so that plants succumb from pathogenic attack. The various interactions of glyphosate with nutrition are represented in the following schematic:

Schematic of glyphosate interactions in soil



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