Glyphosate Use in the Nursery and Landscape Industries and Nonselective Alternatives

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A Roundup on Glyphosate
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History of Glyphosate

- Discovered as a herbicide by a Monsanto scientist in 1970
- Patented in 1971
- Introduced commercially as Roundup in 1974
- Roundup Ready soybeans introduced in 1996
- Patent expired in 2000

Glyphosate acid

glyphosate isopropylamine salt
Glyphosate Mode of Action

- Inhibits enolpyruvyl shikimate-3-phosphate (EPSP) synthase, needed for synthesis of aromatic amino acids tryptophan, tyrosine, phenylalanine in plants

- Animals/people do not make these amino acids

- Result – a chemical that controls plants with low acute toxicity to animals/people

- Caution signal word
Glyphosate – the active ingredient in Roundup

• Nonselective postemergence herbicide

• Systemic – so it controls underground portions of perennial weeds (roots, rhizomes, tubers, etc.)

• Essentially no soil activity – can plant a week after application
Glyphosate Use in the Nursery and Landscape Industries

1. Site Preparation – controlling annual and perennial weeds prior to planting
2. Directed spray around established plants in nurseries and landscape beds
3. Weed control in noncrop areas – perimeter of nurseries, driveways, parking lots, sidewalks, rights of way, and other areas
4. Weed control under greenhouse benches
5. Dormant applications to bermudagrass turf
6. Renovation of turf areas
7. Weed control in irrigation ponds/bodies of water
8. Growth regulation of groundcovers in Christmas tree production
Chemical Alternatives to Glyphosate – Nonselective Postemergence

• No easy replacement
• One contact/systemic herbicide
• Rest are contact herbicides
Glufosinate (Finale, Cheetah Pro, others)

Contact/systemic

• Activity within 1 – 4 days
• Better than contacts on perennial weeds, somewhat less effective on perennials than glyphosate
• Good on cutleaf evening primrose, doveweed, dayflower, white clover
• Keep off bark of young trees
• 2-6 quarts per acre
• Warning or Caution signal word
Contact Nonselective Herbicides

• No direct effect on underground portions of perennial weeds (rhizomes, bulbs, tubers, etc.)
• Coverage is important – smaller weeds easier to control
• Annual weeds more than 6 inches tall may require retreatment
• Multiple applications needed for perennial weeds
Diquat (Reward, Diquat, others)

Contact herbicide

• Quick results – within 24 hours
• Need a nonionic surfactant
• 1-2 pints/A
• The contact part of Roundup QuikPro (diquat + glyphosate)
• Caution signal word
Herbicidal Soaps

Pelargonic acid, related fatty acids

Scythe, AXXE

- Rapid action – as fast as 15 minutes
- 3-10% solution for weed control, up to 20 gallons product per acre
- 75-200 gallons of spray per acre
- Scythe used as an adjuvant for glyphosate
- Distinctive odor, Warning signal word
- AXXE – OMRI Listed
Acetic acid

WeedPharm, others

• More concentrated than vinegar (20% vs ~7%)
• Very rapid action – as fast as 15 minutes
• Thorough coverage of weed foliage is needed
• 15-30 gallons product per acre
• OMRI Listed
• Danger signal word
Plant Oils

Citrus oil (d-limonene) – Avenger (OMRI listed), Caution signal word

Clove oil, cinnamon oil – WeedZap, others (OMRI listed), BurnOut (clove oil + citric acid)
Alternatives to Herbicides

- Flame weeders – almost as effective as contact herbicides
- Steam – contact kill
- Foam / Steam
Summary

- Read the scientific literature
- Compare available options and determine the best fit for your operation
- Certain options are approved for organic use (OMRI Listed)