

Herbicide Prescriptions

- We usually tank mix herbicides in forestry, so we need to look at how each product works
- There are 3 possible results when mixing herbicides
 - Synergy – we get more control than expected from either product
 - Additive – each product controls labeled weeds, broadening spectrum of weed control.
 - Antagonism – one product interferes with the activity of the other resulting in less weed control than each product would bring individually.

Mode of Action Forestry Herbicides

- 4 basic modes of action
 - Enzyme inhibitors
 - Auxin simulators
 - Chlorophyll inhibitors
 - Protox inhibitors

MODE OF ACTION

Photosynthesis inhibitor

- Hexazinone - Velpar ULW, Velpar L, Oustar
- Photosynthesis inhibitor - site of activity in the chloroplasts - interrupts electron transport - may cause cell membrane damage
- Primarily xylem mobile
- Pre and Post emergent activity
- Primarily soil active, may cause localized necrosis in foliage

MODE OF ACTION

Auxin Response

- Triclopyr - Garlon 4 and Garlon 3A; aminopyralid – Milestone; picloram - Tordon ;
- Plant growth regulator - Auxin-type response, effects many physiological processes, primarily cell wall plasticity and nucleic acid (RNA, DNA) metabolism, leading to uncontrolled cell division and growth, preventing photosynthate movement from the leaves to the roots
- Post emergent weed control
- Translocates in the xylem and phloem
- Primarily foliar and stem uptake

MODE OF ACTION

ENZYME INHIBITORS

- Glyphosate - Accord Concentrate, Accord SP, Glypro; Imazapyr – Arsenal AC, Chopper, Chopper Gen II; Metsulfuron methyl – Escort XP; Sulfometuron methyl – Oust XP
- Inhibits enzyme - reducing levels of three amino acids –
- The enzymes site found only in plants
- Some post only most pre and post emergent weed control
- Primarily foliar uptake
- Translocates in xylem and phloem

Mode of Action Protox Inhibitors

- Quick Silver, Edict, Detail many others
- In agriculture used for glyphosate resistant weeds
- Inhibits the plant enzyme protoporphyrinogen oxidase
- Protoporphyrin IX accumulates, and is toxic to plants at high levels
- Early literature reported energy build up in the cell causing cell membrane to rupture.
- Sold as an activator for glyphosate? This product requires heavy coverage, typically works best in applications 100 gpa or more.