

## Hormone herbicides & PPO Inhibitors

### Auxin Mimics

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- ▶ Herbicides
  - 2,4-D & dicamba
- ▶ MOA
  - causes abnormal cell growth resulting in collapsing of vascular tissues
- Symptoms
  - twisting of leaves and stems on broadleaves
  - cupping & strapping of leaves on broadleaves
  - fusing of brace roots in corn

### Terms to remember

- ▶ photosynthesis (food)
- ▶ respiration (energy)
- ▶ amino acids (proteins/growth)
- ▶ lipids (cell membranes)
- ▶ pigments (energy/light capture)
- ▶ mitosis (cell division)

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## 2,4-D / Many Trade Names

Used on corn, sorghum, wheat, pastures  
 –READ THE LABEL FOR SAFE APPLICATION  
 TIMING

Available as acid, salts, amines, & esters  
 “Acid” is the active herbicide – NOT VOLATILE  
 Salts and Amines – NOT VOLATILE  
 Esters – VOLATILE C5 < LOW VOL C6 >  
 Why keep esters?

## 2,4-DB / Butyrac

Requires metabolism (beta oxidation) to  
 become active in the plant

Peanuts, Alfalfa, and Soybeans  
 Many tank mixes

## MCPA / Many Trade Names

Rice, small grains, flax, peas, turf, pastures  
 and rangeland

Safer than 2,4-D on wheat

Usually mixed with other herbicides

## Dicamba / Banvel, Clarity, Distinct

Corn, sorghum, small grains, asparagus,  
 turf, pastures and non-crop

Has soil residual activity

Will leach, do not use under tree dripline

Generally controls difficult to control  
 broadleaf weeds better than 2,4-D

## Clopyralid / Stinger, Reclaim, Transline

Stinger – sugar beets, corn, small grains, pastures  
 & rangeland.

Canada thistle control in Midwest!!!!

Reclaim – Specialty product for OK, NM, & TX

Mesquite, acacias, other woody species

Transline – Industrial sites, rights-of-way, non-  
 crop

Obviously each with a different price.

## Picloram / Tordon

–Restricted Use Herbicide

–Very active on non-target plants

–Ground water hazard

–Reasonably long residual life

–CRP, pastures and rangelands, fallow crop land  
 and fallow small grains

–NOT FOR RESIDENTIAL USE

## Triclopyr / Garlon, Redeem, Remedy, Grandstand, Pathfinder

- Garlon – only non-cropland use
- Redeem and Remedy – pastures and rangeland, mesquite control, & other brush
- Grandstand and Redeem – Xmas trees
- Pathfinder – stump treatment

## PPO Inhibitors / Diphenyl ethers

Mode of Action – Inhibit chlorophyll synthesis

Location of activity in plant

1. Contact type herbicides so they inhibit chlorophyll production only in the leaves they contact

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## PPO Inhibitors / Diphenyl ethers

Selective postemergence control of broadleaves in crops

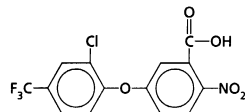
Chemical properties

- Can persist for several weeks / months – some concerns for rotational crops
- No big leaching or photo-decomposition concerns

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## PPO Inhibitors / Diphenyl ethers

- Spurges, morningglory, poor grass control
- Limited soil activity – *from control stand point*
- Inhibit chlorophyll synthesis
- Antagonistic with many grass control herbicides



## PPO Inhibitors

Herbicidal properties

- Generally fast acting contact-type herbicides
  - a) Some crop injury can be expected
- Little if any translocation when taken up by shoots
  - a) Fomesafen can be taken up by roots and translocated
  - b) Carryover concerns

**Selectivity**

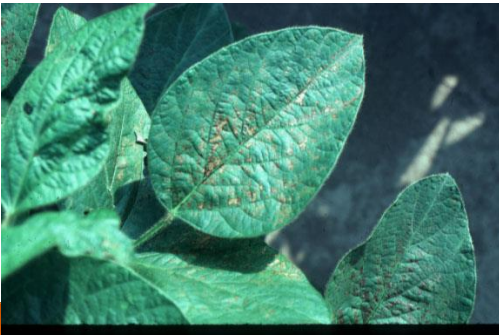
- Broadleaves are generally sensitive
- Tolerant plants rapidly metabolize the herbicide
- Coverage is Important

## Specific PPO Inhibitors

### Acifluorfen / Ultra Blazer

- Soybeans, rice & peanuts
- Leaf bronzing
- Many tank mixes and some premixes
  - a) With Basagran (Storm – south & Galaxy – north)

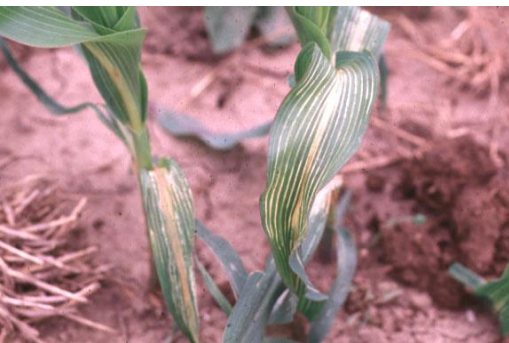
### Leaf Bronzing with Blazer



### Sorghum injury from Blazer



### Veinal Chlorosis from fomesafen carryover



### Lactofen / Cobra

- Cotton (PDS), soybeans, southern pine seedbeds
- Better than Blazer, but causes more injury
- Grass control

## Oxyfluorfen / Goal

- PRE uses – conifers, fruit and nut trees
  - a) This herbicide has soil residual activity
- POST – directed, crop injury if over-the-top. – Cotton uses

