Diagnosing Herbicide Injury Problems

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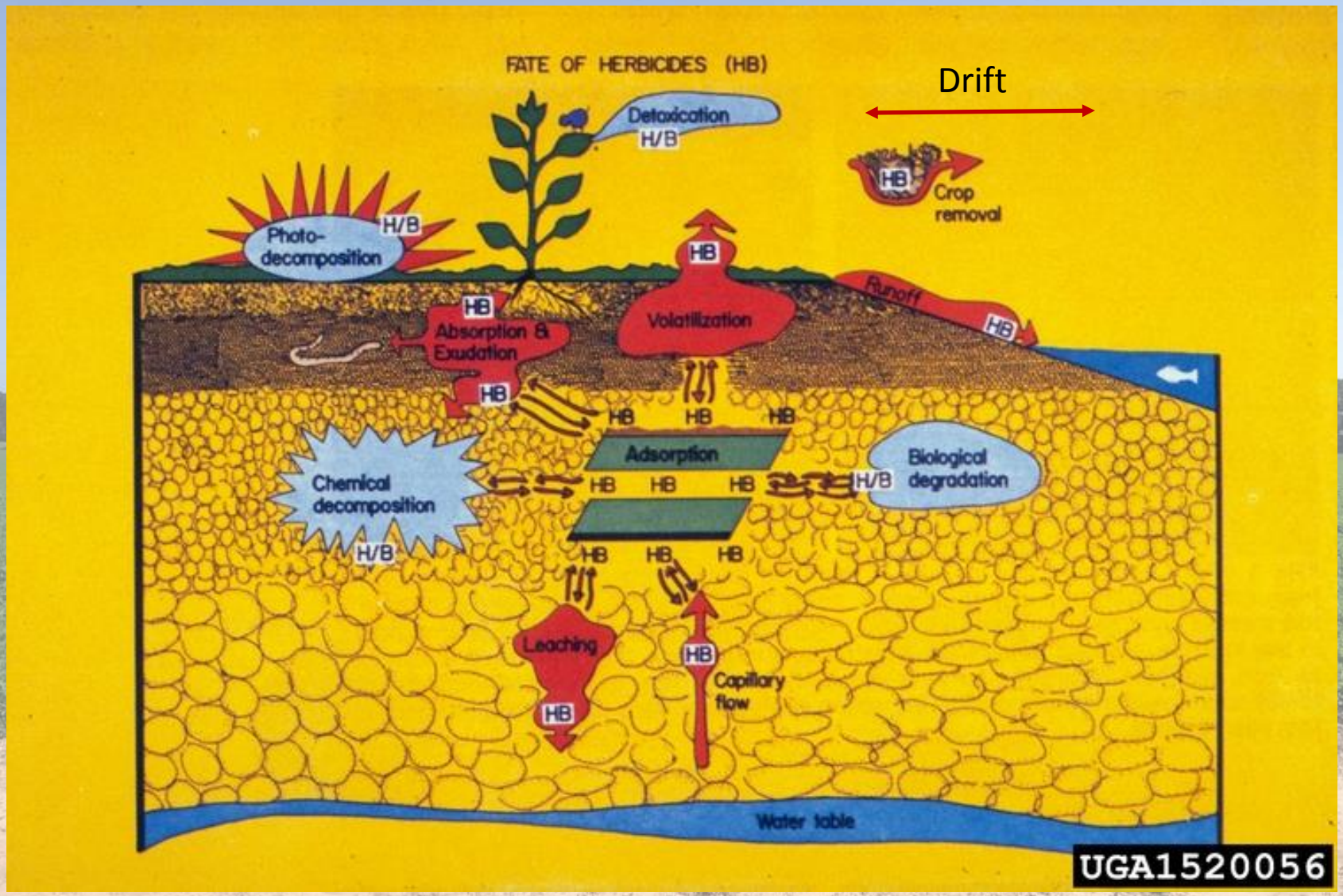
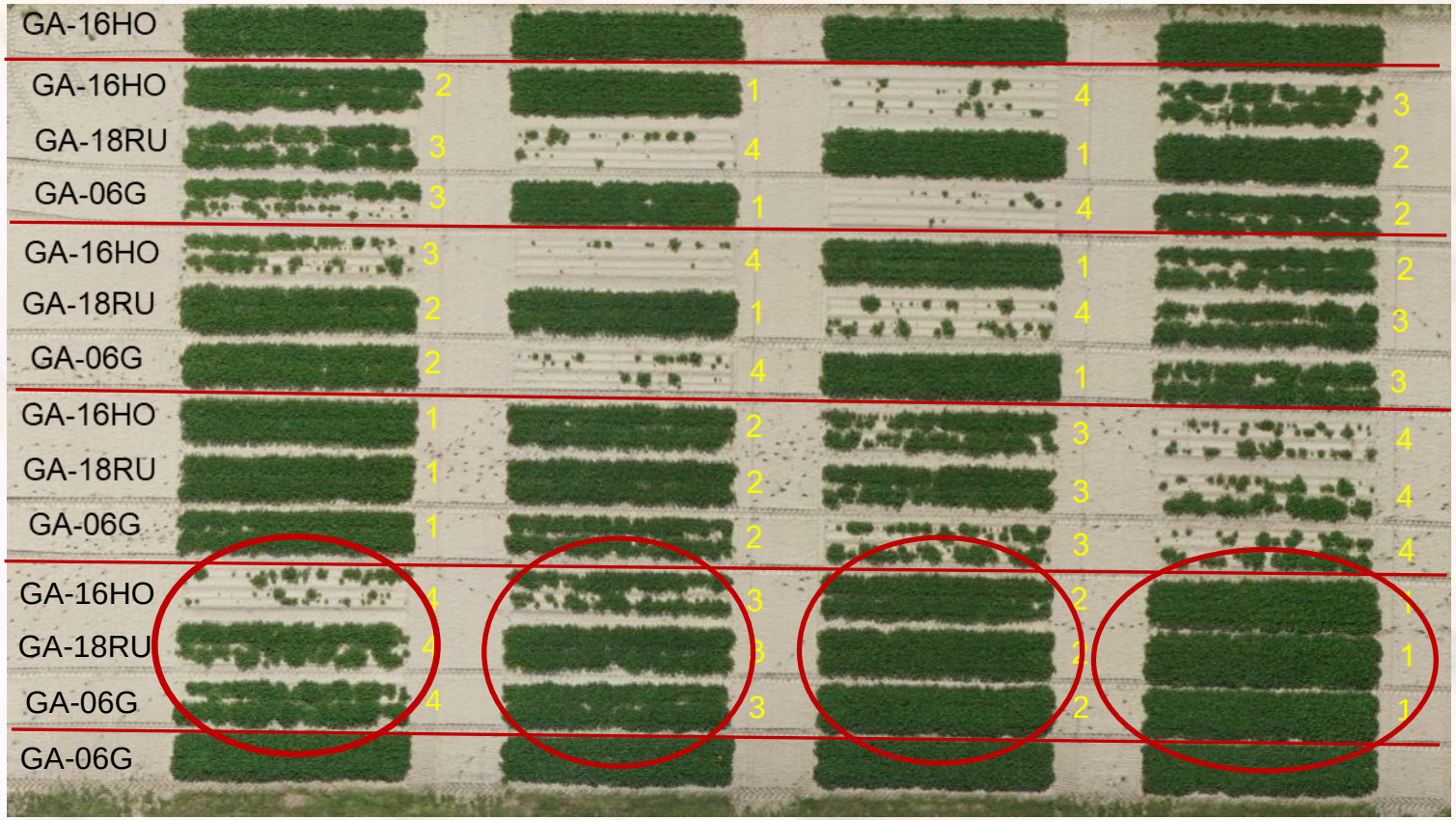
What happens when you spray an herbicide (or any pesticide)?



Potential Causes of Herbicide Injury

- Wrong rate/timing for crop/soil type
  - *label*
  - *calibration*
- Off-Target Movement (UPW)
  - *physical drift*
  - *volatility*
- Sprayer Contamination
- Carryover

Peanut Variety Response to Brake 1.2SL - 2019



1 = NTC
2 = 16 oz/A
3 = 32 oz/A
4 = 64 oz/A

PE-04-19
July 7
67 DAP

Profine/Sandea (halosulfuron) PRE on Sorghum

Soil pH = 5.7
Nematodes: ring (9)

Paraquat Drift

Valor Sprayer Tank-Contamination

Valor/Sprayer Clean-Out

- **Spray equipment, including mixing vessels and nurse tanks, must be cleaned each day following Valor EZ Herbicide2 application. After Valor EZ Herbicide2 is applied, the following steps must be used to clean the spray equipment:**
- **1. Completely drain the spray tank, rinse the sprayer thoroughly, including the inside and outside of the tank and all in-line screens.**
- **2. Fill the spray tank with clean water and flush all hoses, booms, screens and nozzles.**
- **3. Top off tank, add 1 gallon of 3% household ammonia (or equivalent) for every 100 gallons of water, circulate through sprayer for 5 minutes, and then flush all hoses, booms, screens and nozzles for a minimum of 15 minutes. If diaphragms are being used on the spray boom, loosen diaphragms before flushing the spray system, allowing cleaning solution to spray through the open diaphragm. If spray lines have any end caps, they must be loosened before flushing the system, allowing cleaning solution to spray through the loosened caps*. To enhance removal of Valor EZ Herbicide2 from the spray system, add a tank cleaner for example "Valent Tank Cleaner" from Valent U.S.A. LLC, in place of ammonia and allow the cleaning solution to remain in the pressurized spray system (spray tank, hoses and boom) overnight before flushing the system for a minimum of 15 minutes.***
- **4. Drain tank completely.**
- **5. Add enough clean water to the spray tank to allow all hoses, booms, screens and nozzles to be flushed for 2 minutes.**
- **6. Remove all nozzles and screens and rinse them in clean water. Thoroughly clean spray equipment, including all tanks, hoses, booms, screens and nozzles, cleaned before it is used to apply postemergence pesticides. Equipment with Valor EZ Herbicide2 residue remaining in the system may result in crop injury to the subsequently treated crop.**

Picloram Carryover to Peanut

Grazon P+D Label


Specimen Label

RESTRICTED USE PESTICIDE

Dow AgroSciences

Grazon® P+D

Specialty Herbicide

*Trademark of Dow AgroSciences LLC

For the control of broadleaf annual and perennial weeds, and certain woody plants and vines on CRP, rangeland and permanent grass pastures

Keep Out of Reach of Children

DANGER PELIGRO

Precautionary Statements

Hazards to Humans and Domestic Animals

Personal Protective Equipment (PPE)

Engineering Controls

User Safety Recommendations

First Aid

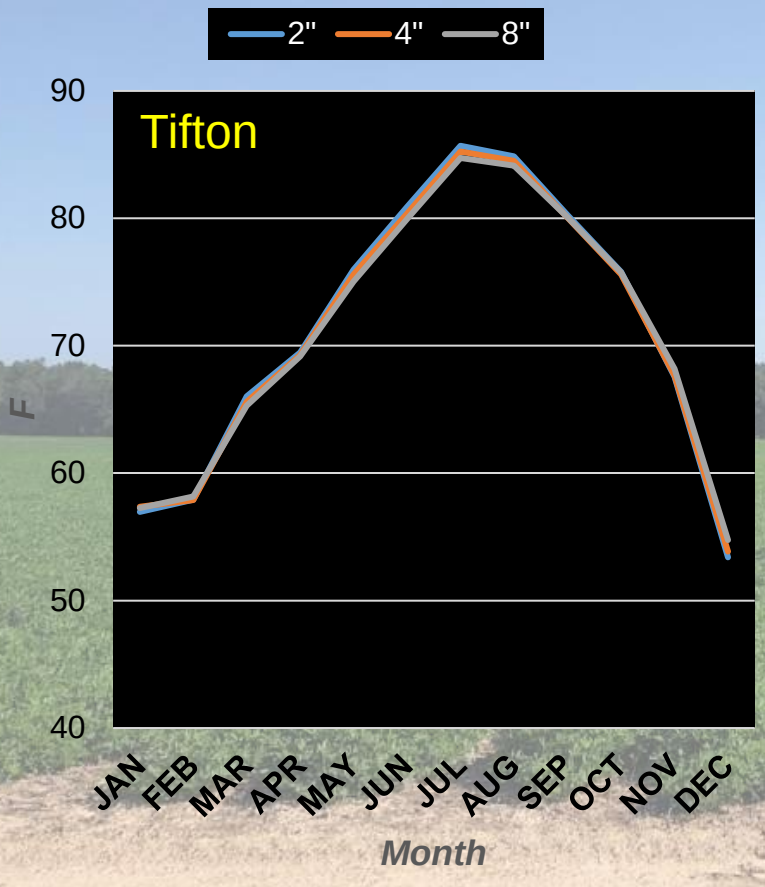
- For the control of broadleaf annual and perennial weeds, and certain woody plants and vines on CRP, rangeland and ***permanent*** grass pastures.
- On areas treated with this product, ***do not rotate to crops intended for food or feed use, other than range or pasture grasses, rye, forage sorghum, sudangrass, wheat, barley or oats not underseeded with a legume.***
- Do not move treated soil, or use treated soil for growing other plants until soil residues of picloram are no longer detectable as indicated by an adequately sensitive bioassay or chemical test.
- Do not use grass or hay or plant materials from treated areas or manure from animals being fed treated forage or hay for composting or mulching of desirable, susceptible broadleaf plants.
- Do not use manure from animals grazing treated areas on land used for growing broadleaf crops, ornamentals, orchards or other susceptible, desirable plants. Manure may contain enough picloram to cause injury to susceptible plants.

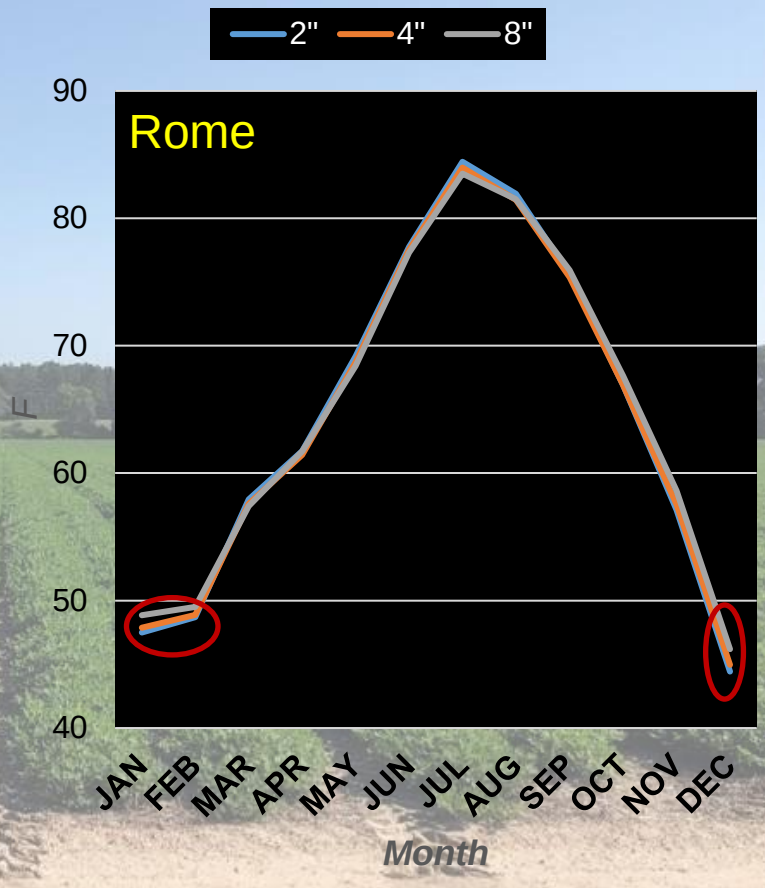
Herbicide Carryover

- Has not been that common in GA (at least for me)
- Depends upon many factors
  - *crop/rate/soil texture/OM/pH/tillage/ environment*
- much of GA is in an environment that favors the breakdown of herbicides
  - *high rainfall, low OM, lighter soils, soils never freeze*

Average Daily Soil Temperatures - 2020

(Optimum soil temperatures for microbial activity are 60-85° F)





Source: UGA Weather Network

My Extension Experience (28 years)

- Many, not all, herbicide injury complaints turn out to be something else.
  - *low soil pH*
  - *nematodes*
  - *soil compaction*
- Keep a soil/nematode/compaction probe and plastic bags in your truck at all times.
- Standard soil testing and grid sampling can often miss hot spots.

Valor Injury or Soil pH/Zn?

July 2007
pH = 5.04
Zn = 14-17 lbs/a

Herbicide Injury or Nematodes???

796-Rootknot nematodes/sample
50+ is a problem

Herbicide Drift or Potassium?

Soybeans are a ***BIG*** user of potash (1.14 lbs K_20 removed/bushel)

Herbicide Symptomology

- First and foremost, I am available 24/7 if you need me (***229-392-1034***)
- Purdue University
  - https://www.btny.purdue.edu/Extension/Weeds/HerbInj2/InjuryHerb1.html
- University of California
  - http://herbicidesymptoms.ipm.ucanr.edu/?src=sub
- University of Florida
  - Cotton (https://edis.ifas.ufl.edu/pdffiles/AG/AG36700.pdf)
  - Corn (https://edis.ifas.ufl.edu/pdffiles/AG/AG37400.pdf)
  - Peanut (https://edis.ifas.ufl.edu/pdffiles/AG/AG33700.pdf)
- Texas A&M University
  - Peanut (http://publication.tamu.edu/PEANUTS/PUB_peanuts_Peanut%20Herbicide%20Injury%20Symptomology%20Guide.pdf)
- Montana State University
  - https://msuextension.org/pubs/herbicideinjuryguide/index.html
- Australia Dept. of Primary Industries
  - Cotton (https://cotton.ces.ncsu.edu/wp-content/uploads/2015/07/CRC-Herbicide-Symptoms.pdf?fwd=no)
- Oregon State University
  - Grapes (https://catalog.extension.oregonstate.edu/sites/catalog/files/project/pdf/em8860.pdf)

Herbicide Injury Problems Are Preventable

- Read/follow label
- Use right rate for soil type
- Calibrate sprayer
- Follow labeled crop rotation restrictions
- Proper sprayer cleanout
  - *Rush and flush don't cut it*
- Avoid off-target movement (UPW)
  - *situational awareness, wind speed/direction, nozzle type, boom height, speed, pressure, etc.*
- Do not put herbicides in unlabeled containers

Information You Must Collect

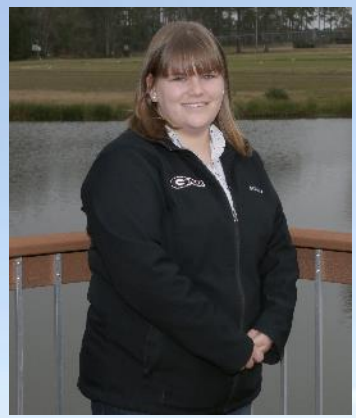
- At the very least …
  - *Last year's crop*
  - *Last year's pesticides*
  - *This year's crop and variety*
  - *This year's pesticides applied*
  - *Last pesticide in sprayer*
  - *Neighboring crops*
- Your awesome if you have…
  - *Soil Test Results*
  - *Nematode Results*

Know Who to Contact
(Your Extension Weed Science Team)

Eric Prostko
Peanuts, soybeans, field corn, sunflowers, grain sorghum, sesame, canola, field pea

Mark Czarnota
Ornamentals, small fruits, nursery, landscape, greenhouse, Christmas Trees

Stanley Culpepper
Cotton, small grains, vegetable crops (including sweet corn)



Lisa Baxter
Forages

Patrick McCullough
Turf
Forages
Pastures
Right of Way
Non-crop

Gary Burtle
Ponds/Aquatics

Wayne Mitchem
Tree fruits
(NCSU)

Questions/Comments

- Slide set is available at ***gaweed.com***