Diagnosis of Herbicide Injury

Herbicide injury could be caused by a variety of application, environmental, chemical and plant related factors. In diagnosing herbicide injury one must use a systematic approach to prevent the bias of looking only for the familiar causes and drawing premature conclusions. Symptoms may overlap or appear similar to many other problems (i.e., herbicide look-alike symptoms). Diagnosis of herbicide injury requires a keen, investigative approach combined with careful, time sensitive, observation and the ability to put all the pieces together to reconstruct the event(s) that produced the plant damage. Accurate diagnosis must be made before corrective action can be taken; even if no corrective measures are available, there is satisfaction in simply knowing what caused the problem, which could help avoiding the problem in future practices. It is of utmost importance to start the investigation as early as possible, it is difficult to determine the cause of injury when examining dead and dry plants. Also, photos of developing plant injury can be helpful; one snap shot may not tell the complete story. If a logical conclusion to injury problems may not be possible, do not suggest possible causes (once you tell someone it is herbicide injury you will never change their minds to something else).

To draw unbiased and logical conclusions, accurate information is needed and can be gathered from a series of questions and detailed field observations/examinations. Below is a checklist of questions/observations that should help you with diagnosis of herbicide injury in plants:

1- General information:
   - Name and the role of the person who is reporting the problem.
   - Location of the reported problem (city/town and name of ranch/farm/etc.).
   - Date problem was first noticed.

2- Application and chemical related information:
   - When was the sprayer last calibrated? Method of calibration? GPA?
   - What nozzles, speed, pressure was used?
   - What was the spray boom width?
   - What was the rate and total volume of application?
   - How much herbicide was added per tank?
   - What other chemicals have been sprayed with the same equipment? When? How many acres?
   - What herbicides were used in the field where the problem occurred? Adjacent field(s)? This year? Last year?
   - Look for injury in bands, injury at the ends of fields.
   - Look for faulty equipment, poor agitation, improper nozzles or spacing.
   - Take photos of (or draw) injury patterns in the field.

3- Environment related information:
• Environmental conditions prior to and during application and symptom development. Air and soil temperatures? Moisture? Humidity? Rainfall? Hail? Wind direction and velocity?
• Where is the plant being grown? (Commercial field, landscape, home garden, greenhouse, etc.)
• What is the soil type? Texture? Drainage? Caliche? Hardpans? Describe other soil characteristics (are soil tests available?)
• Describe the irrigation practices. How much? How often? How applied? Etc…
• Describe the fertilization practices. What? How often? How applied? Etc…
• Other management practices. Conventional or organic production? Specific crop/plant managements? Seed treatments? Use of other chemicals (fungicides, insecticides, etc.)?
• Look for drift pattern (note gradient in the injury symptoms), check prevailing wind direction.
• Look for the change in symptoms in the field and whether they are related to the change in the soil type and soil organic matter.
• Look for obvious symptoms of insect, diseases, wind, and/or hail injuries

4- Plant related information:
• What are the injury symptoms?
• What is cropping history (what has been planted in the area in the past 3-5 years)? Varieties?
• What were the past problems (diseases, insects, etc.) in the field or garden?
• What were dates of planting, spraying, etc.?
• What was the stage of crop at the time of application?
• What variety of crop?
• Check for planting depth, symptoms on non-treated adjacent fields (describe how the untreated plant species look like or what is normal and what is abnormal).