GLOSSARY OF TERMINOLOGY USED IN HERBICIDE SYMPTOMOLOGY

C. Shumway          B. Scott

ARKANSAS STATE UNIVERSITY

DIVISION OF AGRICULTURE
RESEARCH & EXTENSION
University of Arkansas System
THIS IS A GLOSSARY OF TERMS USED IN THE DESCRIPTION OF HERBICIDE SYMPTOMATOLOGY.

THE TERMS USED AND THE SYMPTOMATOLOGY DESCRIBED MAY OCCUR WITH MULTIPLE MODES-OF-ACTION.

THE SYMPTOMATOLOGY DESCRIBED MAY OCCUR DUE TO OTHER ENVIRONMENTAL FACTORS AND/OR PRODUCTION INPUTS. REMEMBER TO CAREFULLY EVALUATE ALL POTENTIAL CAUSES OF THE SYMPTOMATOLOGY PRODUCED ON A PLANT WITHIN A FIELD ENVIRONMENT.

** DISCLAIMER – THIS IS FOR GENERAL USE; REMEMBER TO USE ALL OTHER RESOURCES AVAILABLE TO EVALUATE A POTENTIAL HERBICIDE COMPLAINT.**

Disclaimer
All links to external sites open in a new window. You may return to the University of Arkansas System Division of Agriculture web site by closing this window when you are finished. We do not guarantee the accuracy of the information, or the accessibility for people with disabilities listed at any external site. Links to commercial sites are provided for information and convenience only. Inclusion of sites does not imply University of Arkansas System Division of Agriculture's approval of their product or service to the exclusion of others that may be similar, nor does it guarantee or warrant the standard of the products or service offered. The mention of any commercial product in this web site does not imply its endorsement by the University of Arkansas System Division of Agriculture over other products not named, nor does the omission imply that they are not satisfactory.
GLOSSARY OF TERMINOLOGY

APICAL MERISTEM
BLEACHING
BRONZING
CALLUS
CHLOROROSIS
GENERAL
INTRA VEINAL
INTER VEINAL
DESICCATION
EPINASTY
GROWTH INHIBITION
LEAF
BLISTERING
CUPPING
DRAWSTRING EFFECT
VEINS-ABNORMAL

LEAF (continued)
ONION-LEAFING
STRAPPING
LESION, WATER-SOAKED
NECROSIS
NODE STACKED
PIGMENTATION
ROOT
ADVENTITIOUS
FUSED BRACE
PRUNING
STUBBY
ROTTEN NECK
STEM, SPLITTING
WILTING
APICAL MERISTEM – Other terms used are the terminal and growing point. Refers to the undifferentiated cells that are capable of cell division and are located at the tip of the root and shoot. This tissue is also responsible for the apical dominance found in most plants. Several herbicides reduce or stop any growth associated with the meristem and can lead to the death of that tissue.
BLEACHING - Is a term used to describe the loss of all coloration of leaf tissue due to the loss of both the carotenoids and chlorophyll; typically associated with the herbicides in the pigment (carotenoids) inhibitor family.
BRONZING – A term used to describe lesions that have a bronze coloration. These symptoms are typically associated with a sub-lethal dose of a PPO inhibitor.
CALLUS- Is a mass of undifferentiated cells produced within the parenchyma cells; is typical of herbicides classified as growth regulators.
CHLOROSIS – Is the loss of green pigmentation from the foliage due to the loss of chlorophyll; associated with ALS inhibitors, photosynthesis inhibitors, EPSP synthase inhibitors, and others.
INTRAVEINAL CHLOROSIS – IS THE DEVELOPMENT OF CHLOROSIS OR OTHER LOSS OF PIGMENTATION IN THE VEINS WHILE THE TISSUE BETWEEN THE VEINS REMAINS GREEN.
INTERVEINAL CHLOROSIS – Is the development of chlorosis between the veins of affected leaves with the veins remaining green in color.
DESICCATION – Is the rapid drying of plant tissue after the loss of cell function and/or membrane integrity. Is typical of several classes of herbicides.
EPINASTY – An abnormal development of a plant part (stems and petioles) in which the growth on the upper part is more rapid causing an abnormal bending (typically downward). Is a symptom typical of growth regulator herbicides.
GROWTH INHIBITION – The stoppage of any new growth after the uptake of a herbicide. This is typically expressed within the apical meristem. This activity is typical of ALS, ACCase, EPSP synthase inhibitors and others.
LEAF BLISTERING (puckering) – An appearance of blisters or puckering of tissue due to the abnormal cell division in leaf tissue. This is typical of the herbicides classified as growth regulators, but may also be found with certain nonherbicidal damage (insects and viral diseases).
LEAF CUPPING – An abnormal leaf development in which the leaf tissue produces a cup appearance; typical of growth regulator herbicides.
LEAF – DRAWSTRING (OR HEART – SHAPED)
EFFECT: leaves are cupped and crinkled with the appearance of a shortened main vein.
LEAF, NET-VEINED - ABNORMAL DEVELOPMENT – DICOT LEAVES HAVE A FEW PROMINATE VEINS AND VARIOUS GROWTH REGULATOR HERBICIDES CAN CAUSE INJURY TO THESE TISSUE. THESE ARE SHOWN BELOW.
LEAF – ONION LEAFING: In grasses it is the malformed and twisted seedlings with leaves tightly rolled in the whorl. Typical of the chloroacetamide family of herbicides.
LEAF SHAPE – The alteration of leaf shape due to the abnormal development is common with several herbicides. The specific symptoms may include strapping (abnormal elongation) and the appearance of parallel venation in a dicot.
LESIONS, WATER SOAKED – Refers to the damage induced by cell membrane disruptors. Results from the loss of cellular contents due to the disruption of the membrane system. This will eventually result in a rapid desiccation of the damaged area. This is typical damage associated with an application of paraquat.
Necrosis – Death of plant tissue and usually characterized by browning and desiccation.
NODES – Stem region where leaves are attached and where new growth from axillary buds may occur. Stacked nodes (reduced to almost a total lack of internode elongation) is a characteristic associated with several ALS inhibitors.
PIGMENTATION – The development of pigments due to injury attributed to an application of a herbicide; some pigment changes can also be attributed to stress or nutrient deficiencies.
ROOTS, ADVENTITIOUS – Roots that develop from any other plant tissue with the exception of the radicle; typically from stem tissue. Adventitious roots are symptoms typical of growth regulator herbicides.
ROOT, FUSED BRACE: Typical of the growth regulators; produces brace roots that develop abnormally and result in poor water & nutrient uptake and increased lodging.
ROOT, PRUNING – The reduced development of root tissue due to the effect of a given herbicide. This may result in reduced nutrient and water uptake and also may result in increased lodging.
ROOT-STUBBY: Root tips become thickened and stubby; typical of the dinitroanalines.
ROTTEN NECK – Refers to the deterioration of the apical meristem and associated tissue in grasses and associated with injury from ACCase inhibitors.
STEM SPLITTING – Abnormal stem development which may swell and split. These symptoms are typical of growth regulator herbicides.
WILTING – The loss of cellular turgidity in leaf tissue. Typical of several classes of herbicides. It is also common in environments with reduced or excessive water availability.
This is a link to the MP44 published by the UA/CES. This contains information on labeled herbicides in the state of Arkansas. This publication also contains information of resistance management, spray information and REIs.

http://www.uaex.edu/publications/pdf/mp44/mp44.pdf

This is a link to the International Survey of Herbicide Resistant Weeds. This website contains current information on herbicide resistant weeds and their management.

http://weedscience.org/

This is a link to the Herbicide Resistant Action Committee. This website contains current information on the management of herbicide resistant weeds and the methods for confirmation of herbicide resistance.

http://www.hracglobal.com/

For further information or comments, please contact the following personnel:

Cal Shumway, Agronomist
COAT, Arkansas State University
State University, AR 72467
Email: cshumway@astate.edu

Bob Scott, Weed Scientist
Lonoke Agricultural Center
Lonoke AR 72086
Email: bscott@uaex.edu