

# A Pictorial Problem-Solving Guide for Common Roadside Vegetation Management Issues

**E-986**



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Oklahoma Cooperative Extension Services  
Oklahoma State University**



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# Chapter 1:

## Aquatic Vegetation Control Problems (1-4)

### 1. Brush under bridges

#### Problems:

- Brush collects debris and impedes proper drainage.
- Excessive vegetation growth impedes ODOT bridge maintenance efforts.
- Vegetative growth can cause damage to concrete structures.

#### Solutions:

- Remove brush and treat the remaining stump with a herbicide to prevent resprouting (refer to E-958).
- Make a dormant basal stem treatment to control brush (refer to E-958).
- Make a foliar herbicide application in early summer to control brush. Treatment used will depend upon location designation as aquatic or terrestrial (refer to E-958).

#### Reference:

- *Suggested Maintenance Practices for Roadside Weed and Brush Problems*, Oklahoma Cooperative Extension Service Circular E-958, current edition.



# Chapter 1:

## Aquatic Vegetation Control Problems (1-4)

### 2. Brush/cattails around culverts

#### *Problems:*

- Roots cause damage to structural integrity of concrete structures.
- Brush collects debris and impedes proper drainage.
- Growth exceeds ODOT safety zones height and can obstruct the view of the hazard.

#### *Solutions:*

- Remove brush and treat the remaining stump with a herbicide to prevent resprouting (refer to E-958).
- Make a dormant basal stem treatment to control brush (refer to E-958).
- Make a foliar herbicide application in early summer to control brush. Treatment used will depend upon location designation as aquatic or terrestrial (refer to E-958).

#### *Reference:*

- *Suggested Maintenance Practices for Roadside Weed and Brush Problems*, Oklahoma Cooperative Extension Service Circular E-958, current edition.



# Chapter 1:

## Aquatic Vegetation Control Problems (1-4)

### 3. Brush/cattails and other vegetation around riprap

#### Problems:

- Brush/ cattails collect debris and impede proper drainage.
- Cattails proliferate rapidly and congest drainage areas.
- Vegetative growth can degrade riprap integrity.
- Riprap areas are often located next to lakes and rivers where vegetation can impede visibility and reduce aesthetics of scenic areas.

#### Solutions:

- Herbicide management programs in drainage areas must involve the appropriate aquatic herbicide.
- Remove brush and treat the remaining stump with a herbicide to prevent resprouting (refer to E-958).
- Make a dormant basal stem treatment to control brush (refer to E-958).
- Make foliar herbicide applications to emerged cattails and other vegetation with specific herbicides labeled for aquatic vegetation (refer to E-958).

#### Reference:

- *Suggested Maintenance Practices for Roadside Weed and Brush Problems*, Oklahoma Cooperative Extension Service Circular E-958, current edition.



# Chapter 1:

## Aquatic Vegetation Control Problems (1-4)

### 4. Cattails/willows in ditches

#### *Problems:*

- Cattails/willows collect debris and impede proper drainage.
- Cattails/willows proliferate rapidly without herbicidal control.
- Mature cattail/willow growth stands may require additional mechanical efforts versus herbicidal control during early growth stages.

#### *Solutions:*

- Herbicide management programs in drainage areas must involve the appropriate aquatic herbicide.
- Remove brush and treat the remaining stump with a herbicide to prevent resprouting (refer to E-958).
- Make a dormant basal stem treatment to control brush (refer to E-958).
- Make foliar herbicide applications to emerged cattails with specific herbicides labeled for cattail control (refer to E-958).
- Drainage areas, in some instances, can be cleared mechanically to remove vegetation and promote drainage.

#### *Reference:*

- *Suggested Maintenance Practices for Roadside Weed and Brush Problems*, Oklahoma Cooperative Extension Service Circular E-958, current edition.





## Chapter 2:

# Environmentally Sensitive Areas (5-12)

## 5. Landowner encroachment of roadsides with crops

### Problems:

- Agricultural producers may encroach upon ODOT highway easements in an effort to increase crop production.
- Cultivation of highway easements can create severe erosion of slopes and ditches.

### Solutions:

- Agricultural trespass of ODOT highway easements can impede safety efforts by violating vegetation height policies and cause visibility restrictions in the safety zone.
- Agricultural infringement upon highway easements can hamper ODOT efforts toward herbicidal control of weed species.
- Certain crops can be injured by herbicide treatments by ODOT and most herbicides utilized by ODOT are not labeled for crop use, with exposure resulting in illegal crop residues.
- ODOT highway easement encroachment should be reported to supervisors for remediation and ODOT “Good Neighbor” policy issue considerations (refer to ODOT RVM Guidelines).
- Avoid treatment of encroaching crops due to illegal crop residue issues (refer to ODOT RVM Guidelines).
- Easement encroachment in the transition zone can be tolerated and serve as a buffer zone as long as easement erosion issues are not exacerbated.

### Reference:

- *ODOT RVM Guidelines*, current edition. Chapters 2, 8, 9, and 13.



## Chapter 2:

# Environmentally Sensitive Areas (5-12)

### 6. Landowners cutting fire breaks in roadsides

#### *Problems:*

- Agricultural producers may encroach upon highway easement to create fire breaks by disking roadside transition areas.
- Disking back slopes and transition areas destroys native grass populations established to prevent erosion and stabilize back slopes.
- Removal of stabilizing vegetation predisposes transition zones to erosion problems.

#### *Solutions:*

- ODOT highway easement encroachment should be reported to supervisors for remediation and ODOT “Good Neighbor” policy issue considerations (refer to ODOT RVM Guidelines).
- Landowners should be encouraged to disk areas on their side of the easement line.
- Proper weed control by ODOT may reduce excessive fuel for fires and reduce landowner tendency to cut fire breaks.

#### *Reference:*

- *ODOT RVM Guidelines*, current edition. Chapters 2, 8, 9, and 13.



## Chapter 2:

# Environmentally Sensitive Areas (5-12)

## 7. Aquatic areas, stream and creek bridges, and other riparian areas

### Problems:

- Aquatic environments can be habitat for sensitive and endangered species and should receive special consideration.
- Aquatic areas can provide ideal growth conditions for excessive vegetation growth requiring management to prevent structural damage or visibility issues.
- Most ODOT vegetation control herbicides have restrictions when used in and around aquatic environments.

### Solutions:

- Utilization of herbicides in and around aquatic environments requires specific herbicides labeled for aquatic sites.
- Management approaches are dependent upon target vegetation species, site definition and herbicide labeling (refer to E-958 and ODOT RVM Guidelines).

### References:

- *Suggested Maintenance Practices for Roadside Weed and Brush Problems*, Oklahoma Cooperative Extension Service Circular E-958, current edition).
- *ODOT RVM Guidelines*, current edition. Chapters 8, 12, and 13.



## Chapter 2:

# Environmentally Sensitive Areas (5-12)

## 8. Adjacent homes & gardens

### Problems:

- Homeowners and property owners may encroach upon ODOT highway easements in an effort to increase the aesthetic appearance of their property along with surrounding ODOT easement.
- Adjacent property owners may establish ornamental and vegetable gardens in close proximity to ODOT highway easements.
- Most vegetable crops and ornamentals can be injured by herbicide treatments utilized by ODOT. Most herbicides utilized by ODOT are not labeled for vegetable crops and indirect exposure can result in illegal crop residues.

### Solutions:

- If homeowners are maintaining easements as “home lawns” by frequent mowing, no actions are required (refer to ODOT RVM Guidelines, Chapter 8).
- If easement vegetation height exceeds safety zone management policies, mowing may be the only alternative (refer to ODOT RVM Guidelines, Chapter 2).
- Contamination of adjacent vegetable crops by ODOT should be avoided and ODOT’s “Good Neighbor” policy should be reviewed (refer to ODOT RVM Guidelines, Chapters 8 and 13).

### References:

- *ODOT RVM Guidelines*, current edition. Chapters 2, 8, and 13.



## Chapter 2:

# Environmentally Sensitive Areas (5-12)

## 9. Herbicide damage to traditional agricultural crops

### Problems:

- Most ODOT RVM herbicides do not have agricultural crop site uses on the label.
- Exposure of crops to ODOT herbicides can result in crop damage and/or illegal crop residues on harvested crops.
- Direct application to crops or drift exposure can cause monetary losses to crop producers and settlement claims against ODOT.

### Solutions:

- Avoid application, drift, and runoff of herbicides to crops.
- Always use traditional untreated buffer zones between treated roadsides and adjacent crop production areas.
- If “ultra sensitive” crop sites are identified, supervisors should decide if no spray buffer zones should be expanded to protect crop sites and ODOT from herbicide damage issues.
- If needed, contact the OSU roadside vegetation management personnel for one-on-one consultation prior to herbicide treatments.
- If applicators become aware of producer complaints concerning crop damage, report the incident immediately to ODOT supervisors.
- Not all damage to crops is herbicide related, nor is all herbicide damage to crops caused by ODOT, so proper diagnosis by trained experts may be needed.

### References:

- *ODOT RVM Guidelines*, current edition. Chapters 8 and 13.



Arsenal® damage to cotton



2,4-D damage to soybeans



Oust® damage to sorghum

## Chapter 2:

# Environmentally Sensitive Areas (5-12)

## 10. Herbicide damage to “ultra sensitive” crops

### Problems:

- Property owners may experiment with “non-traditional” or “alternative crops” (examples: grapes, commercial vegetable crops, commercial nursery production, or canola) in an effort to increase monetary returns from land ownership in close proximity to ODOT highway easements.
- Non-traditional or alternative crops can have heightened sensitivity to conventional ODOT herbicide treatments.
- Most herbicides utilized by ODOT are not labeled for crops, and indirect exposure can result in illegal crop residues.
- Injury claims from ODOT herbicide applications affecting alternative crops can lead to extensive monetary loss claims when compared to traditional crops.

### Solutions:

- Alternative or non-traditional crop sites in close proximity to ODOT highway easements deserve special attention and should be reported to supervisors.
- Supervisors should be proactive in contacting alternative crop producers to assess the need for establishment of special buffer zones that are agreeable to ODOT and the producer.
- If easement vegetation height exceeds safety zone management policies, mowing or rope wick herbicide application may be the only alternative (refer to ODOT RVM Guidelines, Chapters 2 and 8).
- Contamination of adjacent ultra-sensitive crops by ODOT should be avoided and ODOT’s “Good Neighbor” policy should be reviewed (refer to ODOT RVM Guidelines, Chapters 8 and 13).

### Reference:

- *ODOT RVM Guidelines*, current edition. Chapters 2, 8, and 13.



Grapes



Tomatoes

## Chapter 2:

# Environmentally Sensitive Areas (5-12)

## 11. Erosion runoff into surface waters

### Problems:

- Erosion runoff causes degradation of water quality in creeks, streams, rivers and lakes.
- Sediments contained in runoff from erosion sites damages habitat utilized by aquatic organisms including some endangered species and could result in litigation against responsible parties, including ODOT.
- Siltations of drainage systems impedes flow of discharge requiring drainage system flow restoration.

### Solutions:

- All erosion sites and sources of sediment should be addressed by adhering to best management practices, BMP's (refer to *ODOT Storm Water Management Guidelines for Design & Construction Activities*).

### Reference:

- *Oklahoma Department of Transportation Storm Water Management Guidelines for Design & Construction Activities*, current edition.



## Chapter 2:

# Environmentally Sensitive Areas (5-12)

## 12. Roadside wildflower and/or ornamental plantings

### Problems:

- The beauty of wildflowers and ornamental plantings are undeniable, however wildflowers and ornamental plantings require specialized management approaches.
- Most herbicides used by ODOT in the safety zone will harm wildflowers and ornamental plantings.
- Desirable tree root systems radiate outward (up to three times the diameter of the tree's dripline) and root system exposure should be considered when applying soil active herbicides in close proximity to desirable trees and shrubs.

### Solutions:

- ODOT herbicide applicators and mowing crews should contact supervisors before any herbicides are applied to ornamental plantings/wildflowers and before wildflower areas are mowed.
- Supervisors should contact the ODOT maintenance division beautification branch if further guidance is needed.
- Before applying any herbicides, ODOT applicators should thoroughly read the label for precautionary statements concerning ornamental plantings and wildflowers.
- Mowing operations around ornamental plantings should strive to avoid injury to plant material.
- Mowing of wildflower plantings should be withheld until after plants have set seed and seeds are mature, usually in July (refer to ODOT RVM Guidelines).

### Reference:

- *ODOT RVM Guidelines*, current edition, Chapters 2 and 3.





## Chapter 3:

# Erosion Control Problems (13-18)

### 13. Slope erosion from vegetation loss

#### Problems:

- Slopes are harsh sites for growth of vegetation and are prone to erosion if vegetative cover is not managed for optimum growth.
- Some ODOT divisions weaken vegetative growth on slopes due to excessive site disturbance such as mowing of steep slopes or frequent regrading operations.

#### Solutions:

- Any practices that lead to the loss of vegetation on slopes should be minimized.
- Sloped areas should be evaluated by supervisors to determine the most appropriate maintenance plan for the area in question.
- Feasible maintenance plans for slope management should be put into practice as soon as possible.
- Determine if sloped areas with persistent erosion problems should be stabilized by other means if vegetative cover is not sustainable (refer to *ODOT Storm Water Management Guidelines for Design & Construction Activities*).

#### Reference:

- *Oklahoma Department of Transportation Storm Water Management Guidelines for Design & Construction Activities*, current edition.



## Chapter 3:

# Erosion Control Problems (13-18)

### 14. Slope erosion from tractor tire damage

#### Problems:

- Unnecessary or poorly timed mowing of slopes with tractor powered mowers results in tires creating ruts/disturbed areas that are prone to erosion.
- Mowing crews often exceed ODOT recommendations concerning slope mowing by mowing on too steep of slope, mowing too low, and mowing under too wet conditions.

#### Solutions:

- Follow ODOT policies on slope mowing restrictions (refer to ODOT RVM Guidelines, Chapter 2).
- Do not mow slopes with tractor powered units if slopes are wet, consist of unstable soils or are too steep. Unmowed transition zone slopes can be visually pleasing to the motoring public.
- All erosion sites should be reported to supervisors and should be addressed by adhering to best management practices, BMP's (refer to *ODOT Storm Water Management Guidelines for Design & Construction Activities*).

#### References:

- *ODOT RVM Guidelines*, current edition, Chapter 2.
- *Oklahoma Department of Transportation Storm Water Management Guidelines for Design & Construction Activities*, current edition.



## Chapter 3:

# Erosion Control Problems (13-18)

### 15. Erosion during establishment

#### *Problem:*

- Heavy rains, straying vehicular traffic, or other situations may result in the removal of seed, sprigs or sod, or damage of tender vegetation during establishment, leaving roadsides prone to severe erosion.

#### *Solutions:*

- All roadside vegetation establishment efforts should conform to ODOT specifications (refer to *ODOT Storm Water Management Guidelines for Design & Construction Activities*).
- Stockpiling topsoil during construction phases allows topsoil to be used for filling of eroded areas and the use of erosion mats, mulches, and sod can also be used to correct erosion issues.
- Caution should be used when considering herbicide treatments or mowing of newly established areas.

#### *Reference:*

- *Oklahoma Department of Transportation Storm Water Management Guidelines for Design & Construction Activities*, current edition.



## Chapter 3:

# Erosion Control Problems (13-18)

### 16. Erosion from improper maintenance practices (herbicides & mowing)

#### Problems:

- Untimely mowing or inappropriate mowing practices (scalping) can cause suppression of vegetation growing on roadsides and predispose roadsides to erosion.
- Inappropriate use of herbicides and over application of herbicides can suppress bermudagrass establishment or growth of other desirable grasses along roadsides and predispose roadsides to erosion.

#### Solutions:

- Incorporate recommended minimum mowing heights (no shorter than 6 inches) on roadside clear zones and transition zones to minimize scalping (refer to ODOT RVM Guidelines).
- Practice contour mowing.
- If herbicides are used that cause temporary injury to desirable roadside grasses, it is critical that herbicide rates remain as low as possible to minimize desirable grass stand thinning.
- If stand thinning has occurred, consider use of a herbicide treatment that causes less injury than the treatment currently in use (refer to OSU Circular E-958).
- Eroded areas should be reported to supervisors for corrective measures (refer to *ODOT Storm Water Management Guidelines for Design & Construction Activities*).

#### References:

- *ODOT RVM Guidelines*, current edition, Chapters 2 and 3.
- *Suggested Maintenance Practices for Roadside Weed and Brush Problems*, Oklahoma Cooperative Extension Service Circular E-958, current edition.
- *Oklahoma Department of Transportation Storm Water Management Guidelines for Design & Construction Activities*, current edition.



## Chapter 3:

# Erosion Control Problems (13-18)

### 17. Failure to use erosion blankets

#### *Problem:*

- Some areas including slopes with 3:1 (run:rise) or steeper are more susceptible to erosion and if not corrected, erosion will continue to worsen causing increased cost for correction, destabilization of the roadside, clogging of ditches, and sediment pollution in streams.

#### *Solutions:*

- Erosion blankets are a quick, relatively easy step that can be put in place to limit erosion damage and allow desirable vegetation to be established (refer to *ODOT Storm Water Management Guidelines for Design & Construction Activities*).
- Erosion control efforts should have a short-term goal and a long-term goal (refer to *ODOT Standard Specifications for Highway Construction*).

#### *References:*

- *Oklahoma Department of Transportation Storm Water Management Guidelines for Design & Construction Activities*, current edition.
- *Oklahoma Department of Transportation Standard Specifications for Highway Construction*, current edition.



## Chapter 3:

# Erosion Control Problems (13-18)

### 18. Failure to use silt fences, hay bales, etc.

#### Problems:

- Silt loading of drainage areas and surface waters is one of the leading causes of water resource degradation.
- Often, reworked or renovated roadsides are not stabilized sufficiently to prevent sediment loading of surface waters.

#### Solutions:

- Temporary measures should be taken as soon as possible to reduce all silt and sediment deposition into surface waters (refer to *ODOT Storm Water Management Guidelines for Design & Construction Activities*).
- All sediment control efforts should be maintained to insure proper working order according to established protocols (refer to *ODOT Standard Specifications for Highway Construction*).

#### References:

- *Oklahoma Department of Transportation Storm Water Management Guidelines for Design & Construction Activities*, current edition.
- *Oklahoma Department of Transportation Standard Specifications for Highway Construction*, current edition.



## Chapter 4:

# Establishment of Desirable Vegetation (19-26)

## 19. Desirable perennial turfgrasses for roadsides

### Problems:

- Failure to establish desirable perennial turfgrasses on roadsides results in increased erosion, undesirable safety zone vegetation height issues and increased ODOT maintenance input.
- Annual vegetation on roadsides are not as durable as perennials that have continual establishment capacities and recuperative capabilities.

### Solutions:

- ODOT's current IRVMP is a bermudagrass release program for the safety zone with different management strategies for the transition zone (refer to ODOT RVM Guidelines). Roadside managers should plant and maintain turfgrass species appropriate for the safety zone and consider the appropriate native grass vegetation cover for the transition zone (refer to *ODOT Storm Water Management Guidelines for Design & Construction Activities*).

### References:

- ODOT RVM Guidelines, current edition, Chapters 3.
- *Oklahoma Department of Transportation Storm Water Management Guidelines for Design & Construction Activities*, current edition.



## Chapter 4:

# Establishment of Desirable Vegetation (19-26)

## 20. Desirable strip sodding along edges and around structures

### Problems:

- Some ODOT maintenance practices such as “shoulder pulling,” or renovation and installation of required structures can destroy desirable perennial grasses immediately adjacent to the hard road surface.
- Failure to establish desirable perennial turfgrass immediately adjacent to the road surface or around structures can result in increased erosion and the development of an undesirable, hazardous drop-off at the interface of the hard road surface and the shoulder or around required structures.
- Successful establishment involves site preparation, pre-plant fertilization, sod installation, rolling, post-plant fertilization, and post-installation irrigation.

### Solutions:

- As a minimum establishment effort, strips of sod (grass retards) should be laid to help prevent erosion and start the process of vegetative establishment of a desirable, perennial turfgrass (bermudagrass) along the edges of structures and the road surface to protect the integrity of the hard road surface and the adjoining shoulder.





## Chapter 4:

# Establishment of Desirable Vegetation (19-26)

## 21. Solid slab sodding

### Problem:

- ODOT maintenance and construction projects result in large expanses of bare soil areas and these large expanses of bare soil are vulnerable to erosion and the ensuing loss of sediments into drainage areas until a vegetative cover is established.

### Solutions:

- Solid slab sodding of a disturbed area is the quickest means of negating erosion issues if the process is done correctly (refer to *ODOT Storm Water Management Guidelines for Design & Construction Activities* and *Oklahoma Department of Transportation Standard Specifications for Highway Construction*).
- Solid slab sodding will cover the entire disturbed area with a solid, contiguous vegetative cover as opposed to strip sodding, seeding, or sprigging.
- Successful establishment of sod involves soil preparation, pre-plant fertilization, sod installation, rolling, follow-up fertilization, and post-installation irrigation.

### References:

- *Oklahoma Department of Transportation Standard Specifications for Highway Construction*, current edition.
- *Oklahoma Department of Transportation Storm Water Management Guidelines for Design & Construction Activities*, current edition.



## Chapter 4:

# Establishment of Desirable Vegetation (19-26)

## 22. Seeding bermudagrass

### *Problems:*

- Large areas of disturbed roadside require the establishment of a desirable turfgrass such as bermudagrass to stabilize the final graded roadside.
- Establishment of bermudagrass through the use of sod is much more expensive than establishment of bermudagrass with seed, provided proper care is given to the seeded area.

### *Solution:*

- Bermudagrass can be established economically through use of bermudagrass seed and proper seeding equipment (refer to ODOT Storm Water Management Guidelines for Design & Construction Activities and Oklahoma Department of Transportation Standard Specifications for Highway Construction).
- Successful establishment by seeding involves choosing well adapted varieties, soil preparation, pre-plant fertilization, seeding, mulching, and follow-up irrigation for four to six weeks. An additional fertilization one month after seeding may be necessary.

### *References:*

- *Oklahoma Department of Transportation Standard Specifications for Highway Construction*, current edition.
- *Oklahoma Department of Transportation Storm Water Management Guidelines for Design & Construction Activities*, current edition.



## Chapter 4:

# Establishment of Desirable Vegetation (19-26)

### 23. Sprigging bermudagrass

#### Problems:

- Large areas of disturbed roadside require the establishment of a desirable turfgrass such as bermudagrass to stabilize the final grade. Establishment of bermudagrass through the use of sod is much more expensive than establishment of bermudagrass from sprigs. Establishing bermudagrass from seed is a more delicate operation compared to establishment through sprigging.
- Seeding requires increased irrigation frequency compared to sprigged areas, and newly sprouted seeds can be dislodged by heavy rainfall or irrigation water impacts.
- Successful establishment with sprigs involves site preparation, pre-plant fertilization, sprig installation, post-plant fertilization, and post-installation irrigation.

#### Solution:

- Bermudagrass established by sprigging is more durable than seeded bermudagrass and is more economical than establishment with sod when done correctly (refer to *ODOT Storm Water Management Guidelines for Design & Construction Activities* and *Oklahoma Department of Transportation Standard Specifications for Highway Construction*).

#### References:

- *Oklahoma Department of Transportation Standard Specifications for Highway Construction*, current edition.
- *Oklahoma Department of Transportation Storm Water Management Guidelines for Design & Construction Activities*, current edition.



## Chapter 4:

# Establishment of Desirable Vegetation (19-26)

### 24. Initial & supplemental irrigations during establishment

#### Problems:

- Vegetation establishment on roadsides requires adequate soil moisture during initial establishment efforts and additional moisture during the “grow in” period.
- Failure to provide moisture to young plants, sprigs, or sod can result in the death of vegetation and a waste of time and money.

#### Solutions:

- Adequate soil moisture should be provided at the onset of establishment efforts and additional water should be supplied if adequate rainfall does not occur during the “grow in” period (refer to *Oklahoma Department of Transportation Standard Specifications for Highway Construction*).
- If contractors are not responsible for roadside establishment, thoroughly cleaned tanks on ODOT spray trucks can be used to haul additional water during periods of temporary drought to prevent loss of seedlings, sprigs, or sod.

#### Reference:

- *Oklahoma Department of Transportation Standard Specifications for Highway Construction*, current edition.



## Chapter 4:

# Establishment of Desirable Vegetation (19-26)

## 25. Initial fertilization during establishment

### Problems:

- Roadsides are generally nutrient deficient (mainly nitrogen) and supplemental fertilization is required during the establishment of seed, sprigs, or sod.
- If supplemental fertilization is not supplied, establishment is slow and desirable vegetation is weak and more prone to weed invasion and other detrimental stresses.

### Solutions:

- Adequate initial fertilization should be put in place prior to establishment efforts (refer to *Oklahoma Department of Transportation Standard Specifications for Highway Construction*).
- If contractors are not responsible for roadside fertilization during establishment, ODOT roadside managers should apply and incorporate adequate levels of nitrogen, phosphorus, and potassium prior to establishment efforts. Addition of 400 pounds per acre of 15-15-15 should provide sufficient nutrients for initial vegetation growth. The application of lime should never be a standard practice unless a soil test has been performed and soil pH is found to be acidic. In Oklahoma, one-half of the state's soils do not need lime applications.

### Reference:

- *Oklahoma Department of Transportation Standard Specifications for Highway Construction*, current edition.



## Chapter 4:

# Establishment of Desirable Vegetation (19-26)

## 26. Vegetative mulch & asphalt emulsion sprays

### Problems:

- Roadside establishment efforts can be damaged or destroyed if establishment areas are not protected from rain droplet damage, erosion, or excessive drying.

### Solutions:

- When appropriate or when specified, vegetative mulches and / or asphalt mulches can be utilized to protect establishment efforts (refer to *Oklahoma Department of Transportation Standard Specifications for Highway Construction*).
- Mulches protect seedlings and shoots from excessive moisture loss and reduce physical dislocation of plants from the establishment site.

### Reference:

- *Oklahoma Department of Transportation Standard Specifications for Highway Construction*, current edition.



## Chapter 5:

# Herbicide Sprayer Equipment Problems (27-33)

## 27. Design problems

### Problems:

- ODOT sprayer designs vary from one division to the next. Most are skid loaded on dual purpose trucks, consequently sprayers should be designed to function properly in those trucks and withstand seasonal removal and storage.
- Sprayer designs that are “rigid” and lack preplanned allowances for repair of broken parts or lack adjustment capability of booms (both lateral and vertical adjustments) hinder efficiency of spray rigs.

### Solutions:

- Basic spray rig design can be found in the current ODOT RVM Guidelines. Prior to sprayer construction or modification, serious thought should be given to designs that allow operators to fix or replace key components easily and designs should allow a high degree of non-rigid adjustment to the spray head (tip).
- Solid welding to frames with no adjustment capability should be avoided. If possible, ODOT employees responsible for manufacture/ construction of spray rigs should examine several ODOT division spray rigs prior to construction of their own rigs.
- If questions arise about sprayer design, contact OSU RVM personnel for advice.

### References:

- *ODOT RVM Guidelines*, current edition.
- OSU RVM Program, Oklahoma State University, 360 Ag Hall, Stillwater, OK, 74078, phone 405-624-7538.



## Chapter 5:

# Herbicide Sprayer Equipment Problems (27-33)

## 28. Boombuster spray tip problems, improper height

### Problems:

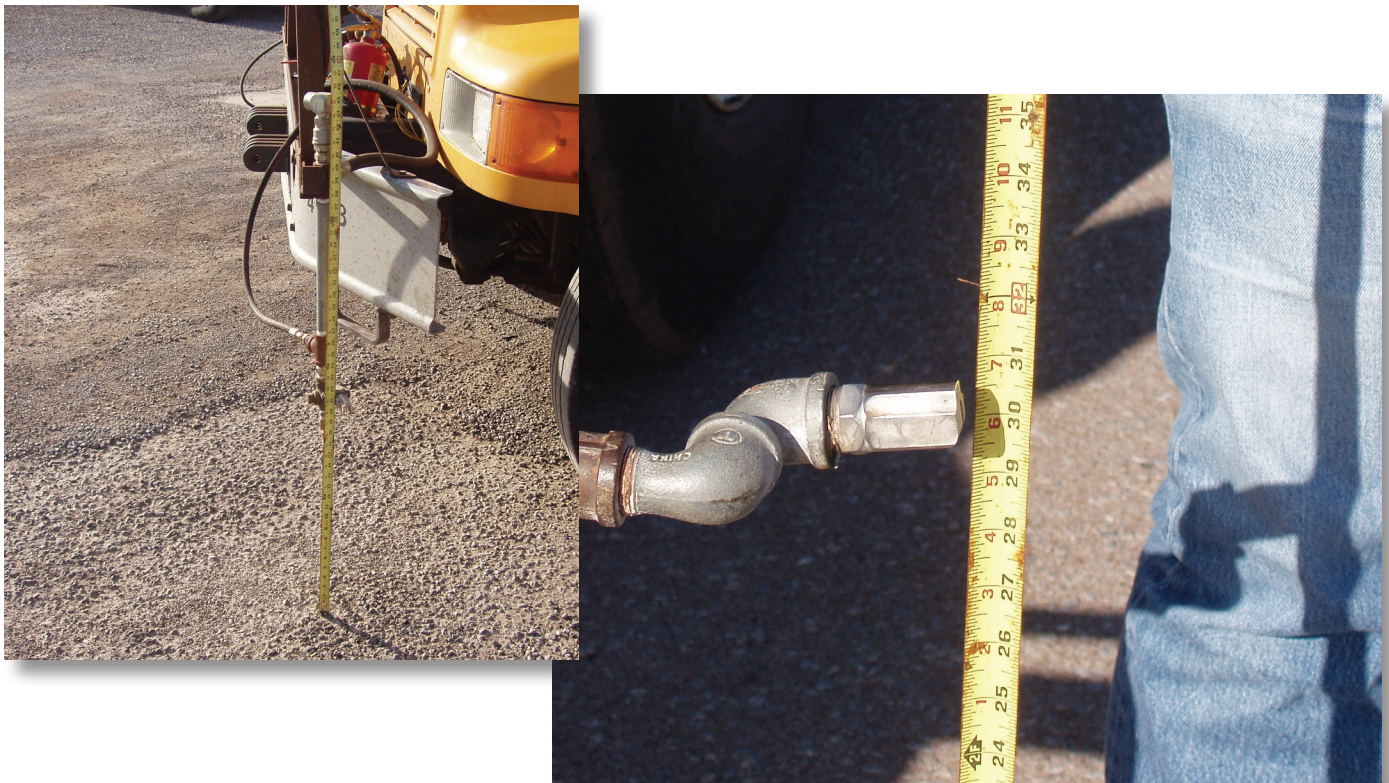
- Many ODOT spray rigs operate Boombuster spray tips that are mounted too close to the road surface. Incorrect tip height affects the distribution of the herbicide spray solution resulting in a non-uniform application pattern.
- Some ODOT spray rigs fail to direct tips at an angle that should be slightly above horizontal resulting in non-uniform application patterns.

### Solutions:

- Boombuster tips function best when tips are mounted 36 to 48 inches above ground level. Pattern distribution is most uniform when tips are set slightly above horizontal (ten degrees above horizontal).
- If shorter patterns are needed, smaller Boombuster tips should be used as opposed to bending tip angles below horizontal (refer to ODOT RVM Guidelines).
- If questions arise about sprayer tip placement, spray tip angles, or which tips to use, contact OSU RVM personnel for advice.

### References:

- *ODOT RVM Guidelines*, current edition.
- OSU RVM Program, Oklahoma State University, 360 Ag Hall, Stillwater, OK, 74078, phone 405-624-7538.





## Chapter 5:

# Herbicide Sprayer Equipment Problems (27-33)

## 29. Damaged Boombuster spray tip

### Problems:

- ODOT spray rigs operating Boombuster spray tips can encounter damage to tips that cause tip pattern failure if not corrected.
- Boombuster tips have a nylon diffuser that will age and deteriorate over time causing pieces to break off the diffuser causing severe pattern distortion.
- While stainless steel Boombuster tip components can last for many years, the diffuser has a limited (4-6 years, longer if protected) active working life.

### Solutions:

- Do not hammer on or mistreat tips. Tips should be thoroughly inspected prior to the beginning of the spray season. Diffusers should be examined with a 10X magnifying glass to see if checking or cracking is/has occurred. If diffuser is broken or suspected of poor performance due to aging, tips (this includes stainless components and diffuser as originally assembled) should be returned for refurbishing to: Evergreen Products, INC., Highway 23 N., P.O. Box 598, Millen, GA 30442, (912)982-5593. Only the manufacturer can replace damaged diffusers.
- A spare tip should be carried in each ODOT spray rig in case of tip failure during herbicide application to allow immediate tip replacement.
- Boombuster tips should be removed, cleaned and stored in the maintenance office during non-spray periods. If Boombuster nozzles are left on sprayers, nozzles should be covered to protect the diffusers from sunlight exposure.
- If questions arise about sprayer tip issues, contact OSU RVM personnel for advice.

### Reference:

- OSU RVM Program,  
Oklahoma State University,  
360 Ag Hall, Stillwater, OK,  
74078, phone 405-624-7538.



## Chapter 5:

# Herbicide Sprayer Equipment Problems (27-33)

### 30. Malfunctioning pressure gauge

#### Problems:

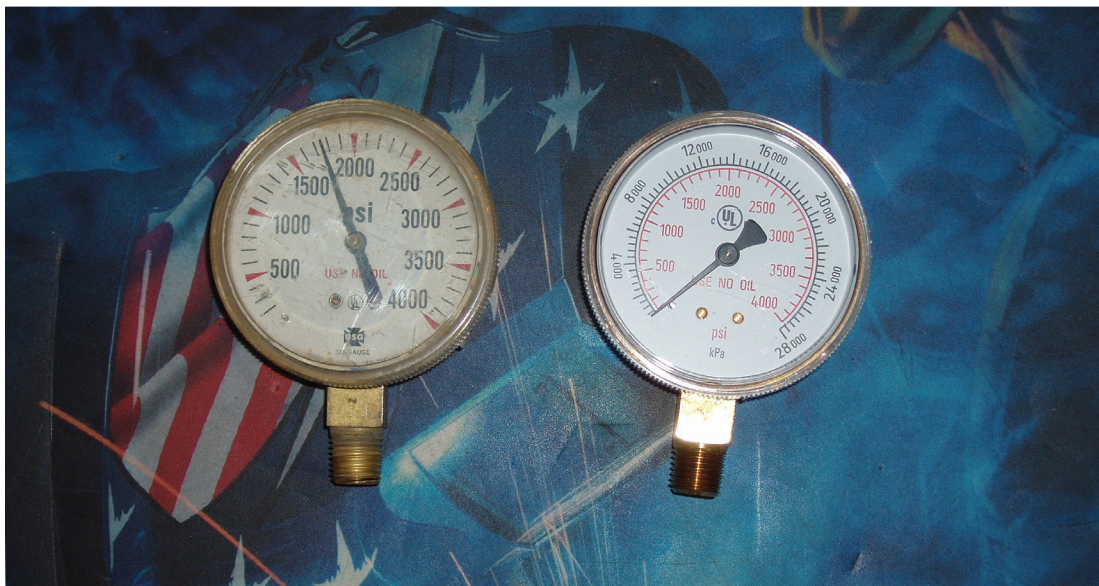
- An improperly functioning pressure gauge can lead to misapplication of herbicides. ODOT policy requires Boombuster applications to be made at a maximum of 25 psi and solid stream sprayer applications at a maximum of 30 psi (refer to ODOT RVM guidelines).
- Small inaccuracies and variations in pressure readings can result in over or under applications that can cost ODOT money, result in poor weed control, or roadside damage that can cause a negative public opinion of ODOT RVM efforts.
- ODOT sprayers cannot be calibrated or operated correctly without properly functioning pressure gauges.

#### Solutions:

- All pressure gauges, including gauge locations (if applicable) at the pump, at the tip, and any gauges attached to the truck cab should be thoroughly inspected and replaced if needed prior to spray season (refer to ODOT RVM Guidelines).
- Use of “oil-filled” gauges, marked to 60 psi, are recommended.
- If questions arise about sprayer gauges and placement, contact OSU RVM personnel for advice.

#### References:

- *ODOT RVM Guidelines*, current edition.
- OSU RVM Program, Oklahoma State University, 360 Ag Hall, Stillwater, OK, 74078, phone 405-624-7538.



Malfunctioning pressure gauge.

Properly functioning pressure gauge.

## Chapter 5:

# Herbicide Sprayer Equipment Problems (27-33)

### 31. Improper spray pressure, too high, resulting in atomization

#### Problems:

- ODOT policy requires Boombuster applications to be made at a maximum of 25 psi and solid stream sprayer applications at a maximum of 30 psi (refer to ODOT RVM guidelines).
- Application pressures in excess of the maximum can result in atomization and off-target drift.

#### Solutions:

- All ODOT applicators should comply with ODOT policy and procedures for herbicide application (refer to ODOT RVM Guidelines) and not exceed 25 or 30 psi, for herbicide applications.
- If higher output is required (GPA, or gallons per acre), move to a larger tip instead of increasing spray pressure.
- If questions arise about sprayer issues, contact OSU RVM personnel for advice.

#### References:

- *ODOT RVM Guidelines*, current edition.
- OSU RVM Program, Oklahoma State University, 360 Ag Hall, Stillwater, OK, 74078, phone 405-624-7538.



## Chapter 5:

# Herbicide Sprayer Equipment Problems (27-33)

### 32. Improper nozzle set-up, edge of pavement is missed

#### *Problems:*

- ODOT spray crews should apply herbicide treatments from the edge of the hard road surface to the bottom of the clear zone, in most cases.
- Failure to treat the immediate roadside edge will create an untreated strip where weeds continue to grow and require additional mowing inputs to maintain the 12-inch growth height limit in the safety zone (refer to ODOT RVM guidelines). This untreated strip can be a few inches to one foot wide, or wider.

#### *Solutions:*

- All ODOT applicators should know where spray patterns begin and end. This should be one of the pre-spray season equipment set-up procedures.
- Boombuster tips designed for roadside use will be designated by an “R” following the tip size number (example: 375-R). The diffuser in the “R” tips are designed to direct the spray pattern backward slightly toward the spray vehicle wheel. This will ensure strips are not missed, if tips are properly positioned.
- If ODOT applicators are not comfortable with driving close to the shoulder using only the Boombuster “R” tips, drop tips can be added to treat the area immediately adjacent to the shoulder.
- If questions arise about sprayer issues, contact OSU RVM personnel for advice.

#### *References:*

- *ODOT RVM Guidelines*, current edition.
- OSU RVM Program, Oklahoma State University, 360 Ag Hall, Stillwater, OK, 74078, phone 405-624-7538.



## Chapter 5:

# Herbicide Sprayer Equipment Problems (27-33)

### 33. Malfunctioning drop nozzle, edge of pavement is missed

#### Problems:

- Some ODOT spray rigs use drop tips to treat the immediate area next to the hard road surface. Failure to treat the immediate roadside edge will create an untreated strip where weeds continue to grow and require additional mowing inputs to maintain the 12-inch growth height limit in the safety zone (refer to ODOT RVM guidelines). This untreated strip can be a few inches to one foot wide, or wider.
- Drop tips are located close to wheels which makes them prone to damage from flying debris and rocks. Drop tips that are damaged, excessively worn, or not properly adjusted will result in partial application failure.

#### Solutions:

- ODOT spray rigs using drop tips should be inspected at the start of the spray season and frequently throughout the spray season to ensure correct drop tip positioning and drop tip performance.
- If drop tips or screens are damaged or worn out, they should be replaced. If misaligned, they should be readjusted to a correct setting.
- Drop tips have small orifices and must always be used with a screen.
- If questions arise about sprayer issues, contact OSU RVM personnel for advice.

#### References:

- *ODOT RVM Guidelines*, current edition.
- OSU RVM Program, Oklahoma State University, 360 Ag Hall, Stillwater, OK. 74078, phone 405-



Distorted nozzle pattern.



# Chapter 6:

## Mowing Problems (34-38)

### 34. Mowing too low

#### Problems:

- Some ODOT mowing crews fail to observe ODOT policy and mow below the approved mowing height of 6 inches (refer to ODOT RVM guidelines).
- Roadsides are harsh environments for vegetation and mowing heights lower than 6 inches can cause loss of desirable vegetation through increased plant stress.

#### Solutions:

- ODOT mowing crews should make sure that mowing heights are not lower than 6 inches. After mower operation in a small area, mowing height can be easily measured and adjusted to leave 6 inches of vegetation.
- Mowing crews should be aware that soft soils can result in sinking of wheels and consequent lowering of mowing heights (scalping).
- If questions arise about mowing issues, contact OSU RVM personnel for advice.

#### References:

- *ODOT RVM Guidelines*, current edition.
- OSU RVM Program, Oklahoma State University, 360 Ag Hall, Stillwater, OK, 74078, phone 405-624-7538.



## Chapter 6:

# Mowing Problems (34-38)

### 35. Mowing transition zones too early and too often (loss of native grasses)

#### *Problems:*

- Some ODOT mowing crews mow transition zones (the area from the ditch bottom up to the adjoining private property) too early in the growing season which causes weakening of native grasses and ODOT mowing crews may also mow these same areas too often causing additional stress and native grass losses.

#### *Solutions:*

- Transition zones are not required to conform to safety zone mowing heights (12 inches maximum). Transition zones are attractive when allowed to grow to their natural heights and will perform better if they are not mowed at all. The only time a transition zone should be mowed is when small tree saplings become evident.
- A clean-up mowing of the transition zone to prevent fire hazard (if required) is acceptable when that mowing is performed in the fall (October).
- If questions arise about transition zone mowing issues, contact OSU RVM personnel for advisement.

#### *Reference:*

- OSU RVM Program, Oklahoma State University, 360 Ag Hall, Stillwater, OK, 74078, phone 405-624-7538.



# Chapter 6:

## Mowing Problems (34-38)

### 36. Mowing speed too fast (heavy vegetation) causing “rooster tails”

#### *Problems:*

- Some ODOT mowing crews drive mowing units too fast in heavy vegetation areas of roadsides.
- Excessive mowing speeds can cause vegetation to be pushed over, twisted, and missed by the mower blades, causing a “rooster tail” effect.
- Unmowed vegetation (rooster tails) that exceed 12 inches in the safety zone require additional mowing. “Rooster tails” in mowed areas are unsightly and detract from desirable roadside appearances.

#### *Solutions:*

- Transition zones are not required to conform to safety zone mowing heights (12 inches maximum). Transition zones are attractive when allowed to grow to their natural heights and will perform better if they are not mowed at all. The only time a transition zone should be mowed is when small tree saplings become evident.
- A fall clean up mowing of the transition zone to prevent fire hazard (if required) is acceptable when that mowing is preformed in the fall (October).
- If questions arise about mowing issues, contact OSU RVM personnel for advice.

#### *Reference:*

- OSU RVM Program, Oklahoma State University, 360 Ag Hall, Stillwater, OK, 74078, phone 405-624-7538.





## Chapter 6:

# Mowing Problems (34-38)

### 37. Mowing timing affecting herbicide application timing (example: johnsongrass vegetation height)

#### Problems:

- Some ODOT mowings do not coincide with herbicide application goals. Vegetation required for herbicide uptake is removed prior to herbicide application.
- Some herbicide treatments for roadside weeds require specific amounts of weed vegetation to be present for effective herbicide uptake by the plant.

#### Solutions:

- It is critical that all ODOT roadside managers integrate both mowing and herbicide programs to maximize benefits of both RVM approaches. Managers should also be aware of local weed species and the label statements on specific herbicides used to control those problematic weed species. Most contact or systemic herbicides will require a substantial amount of leaf area to be available for effective herbicide uptake.
- If questions arise about mowing issues, contact OSU RVM personnel for advice.

#### Reference:

- OSU RVM Program, Oklahoma State University, 360 Ag Hall, Stillwater, OK, 74078, phone 405-624-7538.



# Chapter 6:

## Mowing Problems (34-38)

### 38. Mowing “difficult-to-mow” weeds

#### *Problems:*

- Some hollow stemmed or woody weed species such as mature musk thistle or pigweed can be pushed over by mower units traveling too fast. Even some properly mowed weeds can regrow. Partially mowed weeds may require an additional mowing to remove escaped and/or unsightly vegetation.
- Areas that have missed a mid-summer mowing may have large populations of difficult-to-mow weed species.

#### *Solutions:*

- Areas that have difficult-to-mow weed species should be mowed at slower speeds, allowing the weed to be exposed to the mower blades for a longer period of time.
- Areas that are prone to faster weed growth rates should be evaluated concerning increased mowing frequencies.
- If questions arise about mowing issues, contact OSU RVM personnel for advice.

#### *Reference:*

- OSU RVM Program, Oklahoma State University, 360 Ag Hall, Stillwater, OK, 74078, phone 405-624-7538.



## Chapter 7:

# Terrestrial Weed Control Problems (39-45)

### 39. Brome/cheat/hairy vetch

#### Problem:

- Winter annual weed species (brome/cheat/hairy vetch) germinate in the late fall or early spring and grow rapidly to exceed the ODOT safety zone maximum growth height limits. Competition from these weeds delays the growth of desired warm season perennial grasses in spring. These species require mowing before most desirable summer roadside species. Their presence increases mowing frequencies which costs ODOT maintenance divisions money.

#### Solution:

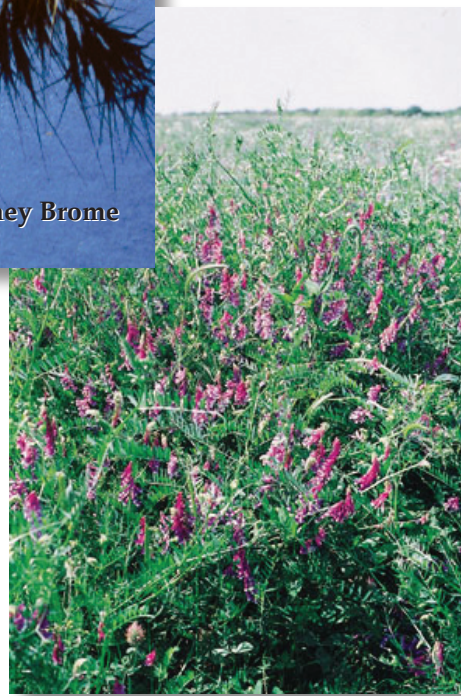
- Treat roadsides infested with these winter annual weeds with Campaign at 2 pts./A + Ammonium sulfate at 17 lbs. prod./100 gallons of water (refer to OSU Circular E-958).

#### Reference:

- *Suggested Maintenance Practices for Roadside Weed and Brush Problems*, Oklahoma Cooperative Extension Service Circular E-958, current edition.



Downey Brome



Hairy Vetch

## Chapter 7:

# Terrestrial Weed Control Problems (39-45)

### 40. Annual Ryegrass

#### *Problem:*

- Annual ryegrass is one of the newer winter annual weeds to become a problem along roadsides. It is tolerant of traditional herbicide treatments. Uncontrolled ryegrass can completely infest roadsides necessitating the need for early spring mowing.
- Annual ryegrass can exceed the safety zone height limits prompting ODOT managers to mow earlier in the spring, increasing the total number of seasonal mowing which increases total mowing costs.
- Annual ryegrass is a major wheat production weed problem and ODOT wants to comply with the “Good Neighbor” policy by preventing a major re-infestation of adjacent wheat fields.

#### *Solution:*

- Treat roadsides with Campaign at 2 pts./A + glyphosate at 0.5 lb. a.i./A + Ammonium sulfate at 17 lbs. prod./100 gallons of water or treat roadsides with glyphosate at 1.0 lb. a.i./A (refer to OSU Circular E-958).

#### *Reference:*

- *Suggested Maintenance Practices for Roadside Weed and Brush Problems*, Oklahoma Cooperative Extension Service Circular E-958, current edition.



## Chapter 7:

# Terrestrial Weed Control Problems (39-45)

### 41. Musk thistle/ scotch thistle

#### Problem:

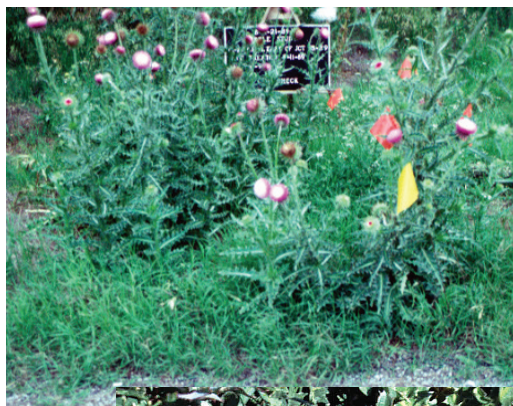
- Under the Oklahoma Noxious Weed Law, all musk, scotch, and Canada thistle must be prevented from producing seed within our state borders. This means ODOT is responsible for preventing thistle seed production along all state highways.

#### Solutions:

- Treat thistles with Overdrive® or Transline®, or metsulfuron methyl (scotch thistle only) herbicides in spring during the rosette or vegetative stage of growth (refer to OSU Circular E-958).
- Low populations of thistles would be treated using handgun applications while moderate to severe populations would be treated using broadcast applications.
- Musk thistle populations can also be suppressed by releasing or maintaining a population of the biological insect control species, head weevil or rosette weevil. Thistles can also be mowed or removed by hand to prevent seed set.

#### References:

- *Suggested Maintenance Practices for Roadside Weed and Brush Problems*, Oklahoma Cooperative Extension Service Circular E-958, current edition.



Musk Thistle



Musk Thistle rosette

ScotchThistle



Scotch Thistle rosette

## Chapter 7:

# Terrestrial Weed Control Problems (39-45)

### 42. Summer broadleaf weeds

#### Problem:

- Most broadleaf type plants along Oklahoma roadsides are not desirable because of their tall growth and competition as well as their negative impact on adjacent agriculture practices. Low-growing annual broadleaf forbs along with native and non-indigenous wildflowers are examples of desirable broadleaf plants.

#### Solutions:

- Maintaining a good stand of perennial grassy-type plant species will prevent most broadleaf weed problems.
- Thin grass stands or disturbed roadsides that become infested with taller summer broadleaf weed species can be treated with Vanquish®, Overdrive®, or metsulfuron methyl to control weeds (refer to OSU Circular E-958). These herbicides can be used as tank mix partners with traditional summer weed control treatments using MSMA or glyphosate based applications.
- Frequent mowing can be used to prevent broadleaf weed seed set which should result in reduced weed stands in the future.

#### References:

- *Suggested Maintenance Practices for Roadside Weed and Brush Problems*, Oklahoma Cooperative Extension Service Circular E-958, current edition.



## Chapter 7:

# Terrestrial Weed Control Problems (39-45)

### 43. Summer grassy weeds

#### Problems:

- Typically summer annual grassy weeds do not create many problems along roadsides.
- Summer annual grassy weeds like crabgrass can slow down or prevent bermudagrass growth and development during initial establishment after construction or roadside recovery after shouldering-up operations.

#### Solutions:

- After initial bermudagrass seeding or sprigging, once the plants have established at least 1- to 3-inch stolons, treat with MSMA (refer to OSU Circular E-958) to control crabgrass and other annual weeds.
- One year after initial seeding or sprigging or after roadsides have received a shouldering-up operation, use MSMA or Plateau® to control crabgrass and sandbur (refer to OSU Circular E-958). Tank mixes with other herbicides may also be beneficial at this time.

#### References:

- *Suggested Maintenance Practices for Roadside Weed and Brush Problems*, Oklahoma Cooperative Extension Service Circular E-958, current edition.



Newly sprigged bermudagrass with crabgrass emerging



Mature crabgrass shading out the shorter growing bermudagrass below

## Chapter 7:

# Terrestrial Weed Control Problems (39-45)

### 44. Johnsongrass identification and control

#### Problem:

- Johnsongrass is an aggressively growing summer perennial grass that creates many problems for ODOT because of its excessive growth height, competitiveness, and misidentification with other summer grasses.

#### Solutions:

- Maintaining a thick, quality stand of desirable grasses will, in itself, keep johnsongrass from becoming too severe of a problem.
- Once it is established, treatment combinations including MSMA, glyphosate, sulfometuron, imazapic, and sulfosulfuron (refer to OSU Circular E-958) can effectively control perennial and seedling johnsongrass.
- Mowing can be used to temporarily suppress johnsongrass populations but has little long term effect.

#### References:

- *Suggested Maintenance Practices for Roadside Weed and Brush Problems*, Oklahoma Cooperative Extension Service Circular E-958, current edition.





## Chapter 7:

# Terrestrial Weed Control Problems (39-45)

## 45. Switchgrass identification and control

### Problems:

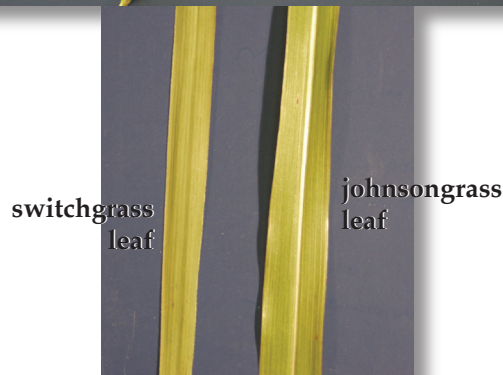
- Switchgrass is a summer perennial bunch grass that is a problem in the safety zone due to its tall height. Switchgrass is tolerant to standard ODOT broadcast herbicide treatments.
- Standard ODOT safety zone RVM programs can, over time, actually release switchgrass, increasing the problem. If standard broadcast johnsongrass treatments appear to fail, it is possible the weed species is switchgrass. Switchgrass is a blue-grey, bunch type grass and lacks a white leaf mid-rib (johnsongrass is a lime green colored, rhizomatous grass, and has a white leaf mid-rib).

### Solutions:

- Ropewick or wiper applications of glyphosate in a 1:2 ratio of herbicide to water is an effective herbicidal control (refer to OSU Circular E-958). Wiping twice, in opposite directions, increases control. Areas that are going to be treated should be left unmowed prior to herbicide treatment.
- Mowing is an important switchgrass control component. Switchgrass areas should be mowed approximately one month and three months after treatment.

### References:

- *Suggested Maintenance Practices for Roadside Weed and Brush Problems*, Oklahoma Cooperative Extension Service Circular E-958, current edition.



## Chapter 8:

# Total Vegetation Control (TVC) Around Roadside Structures (46-50)

## 46. TVC around signs

### Problems:

- Roadside signs are a very important component of proper traffic control and proper traffic flow. A clear, unimpeded sightline between motorists and ODOT signage is critical for safe vehicular movement on Oklahoma highways.
- Vegetation around roadside signs must be managed by ODOT and must conform to maximum height limits in the safety zone. Manual cutting of non-sprayable vegetation is very expensive and labor intensive.

### Solution:

- Roadside vegetation managers can utilize handgun treatments of foliar herbicides and/or soil residual herbicides to suppress vegetation and regrowth (refer to OSU Circular E-958) around signs. Due to the mobility of some TVC herbicides, caution should be used to prevent off-target movement and adverse effects to non-target plants (refer to ODOT RVM guidelines). If questions arise about TVC issues, contact OSU RVM personnel for advice.

### References:

- *Suggested Maintenance Practices for Roadside Weed and Brush Problems*, Oklahoma Cooperative Extension Service Circular E-958, current edition.
- *ODOT RVM Guidelines*, current edition.
- OSU RVM Program, Oklahoma State University, 360 Ag Hall, Stillwater, OK, 74078, phone 405-624-7538.



## Chapter 8:

# Total Vegetation Control (TVC) Around Roadside Structures (46-50)

## 47. TVC around guardrails

### Problems:

- Guardrails are often present along ODOT highways to prevent motorists from inadvertently leaving the highway or from crossing into oncoming traffic. If guardrails are not kept free of roadside vegetation, they can become an extreme hazard to the motoring public. A clear view of guardrails is critical for safe motoring on Oklahoma highways.
- Vegetation around guardrails is managed by ODOT and must conform to maximum height limits in the safety zone. Manual cutting of vegetation that cannot be treated with a herbicide is very expensive and labor intensive.

### Solution:

- Roadside vegetation managers can utilize foliar herbicides and /or soil residual herbicides to suppress vegetation and regrowth (refer to OSU Circular E-958) around guardrails using handguns or specialized spray booms. Due to the mobility of some TVC herbicides, caution should be used to prevent off-target movement and adverse effects to non-target plants (refer to ODOT RVM guidelines). If questions arise about TVC issues, contact OSU RVM personnel for advice.

### References:

- *Suggested Maintenance Practices for Roadside Weed and Brush Problems*, Oklahoma Cooperative Extension Service Circular E-958, current edition.
- *ODOT RVM Guidelines*, current edition.
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## Chapter 8:

# Total Vegetation Control (TVC) Around Roadside Structures (46-50)

### 48. TVC around shoulders, seams, and cracks

#### Problems:

- Growth of weed species in shoulders, seams, or cracks can physically deteriorate the road surface by invading openings allowing water, along with plant roots, to break up asphalt and concrete. This will shorten the lifespan of the highway surfaces. Also, weeds may exceed the ODOT maximum height limits in the safety zone.
- Vegetation growing in shoulder, cracks, and seams should be addressed by ODOT in a timely fashion to prevent premature degradation of the highway surface.

#### Solutions:

- Roadside vegetation managers can utilize foliar herbicides and/or soil residual herbicides to suppress vegetation and vegetation regrowth (refer to OSU Circular E-958) on shoulders, seams, and cracks using handguns or specialized sprayers such as the Patchen sprayer. Broadcast applications can waste a lot of herbicide that does not contact the targeted weeds and should be used carefully.
- Due to the mobility of some TVC herbicides, caution should be used to prevent off-target movement and adverse effects to non-target plants (refer to ODOT RVM guidelines). If questions arise about TVC issues, contact OSU RVM personnel for advice.

#### References:

- *Suggested Maintenance Practices for Roadside Weed and Brush Problems*, Oklahoma Cooperative Extension Service Circular E-958, current edition.
- *ODOT RVM Guidelines*, current edition.
- OSU RVM Program, Oklahoma State University, 360 Ag Hall, Stillwater, OK, 74078, phone 405-624-7538.



## Chapter 8:

# Total Vegetation Control (TVC) Around Roadside Structures (46-50)

### 49. TVC around concrete walls and fence lines

#### Problems:

- Vertical or inclined concrete walls and fencing can present weed control challenges. Growth of weed species in concrete walls can physically deteriorate the wall by allowing plant roots and water to invade openings. Water infiltrating the wall will break up the wall due to the “freeze-thaw” cycle of expansion and contraction. This will shorten the lifespan of concrete walls. Vegetation growing in/on walls should be addressed by ODOT in a timely fashion to prevent premature degradation of the wall integrity.
- Fencing presents another RVM problem requiring timely herbicide application. Mechanical removal of weeds from fencing is labor intensive, temporary, and expensive.

#### Solutions:

- Roadside vegetation managers can utilize foliar herbicides and/or soil residual herbicides to suppress vegetation and vegetation regrowth (refer to OSU Circular E-958) on walls and around fencing using handguns.
- Due to the mobility of some TVC herbicides, caution should be used to prevent off-target movement and adverse effects to non-target plants (refer to ODOT RVM guidelines). If questions arise about TVC issues, contact OSU RVM personnel for advice.

#### References:

- *Suggested Maintenance Practices for Roadside Weed and Brush Problems*, Oklahoma Cooperative Extension Service Circular E-958, current edition.
- *ODOT RVM Guidelines*, current edition.
- OSU RVM Program, Oklahoma State University, 360 Ag Hall, Stillwater, OK, 74078, phone 405-624-7538.



## Chapter 8:

# Total Vegetation Control (TVC) Around Roadside Structures (46-50)

## 50. Loss of vegetation due to soil sterilant runoff damage

### *Problem:*

- Roadside vegetation managers who improperly apply soil residual herbicides can cause loss of desirable vegetation. Some TVC herbicides are highly water soluble and can move off-target in surface runoff or eroded soils. Common mistakes include over application by handgun operator, application on a steep sloped area, and application to hard surfaces where herbicides are washed to other areas.

### *Solutions:*

- Due to the mobility of some TVC herbicides, caution should be used to prevent off-target movement and adverse effects to non-target plants (refer to ODOT RVM guidelines).
- Handgun operators should understand and apply the correct herbicide rate (refer to OSU Circular E-958) when utilizing TVC herbicides and TVC equipment.
- If questions arise about TVC issues, contact OSU RVM personnel for advice.

### *References:*

- *Suggested Maintenance Practices for Roadside Weed and Brush Problems*, Oklahoma Cooperative Extension Service Circular E-958, current edition.
- *ODOT RVM Guidelines*, current edition.
- OSU RVM Program, Oklahoma State University, 360 Ag Hall, Stillwater, OK, 74078, phone 405-624-7538.





