

**EXTENSION**

Managing Deer Damage to Crop Fields in Oklahoma

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The white-tailed deer (hereafter deer) are common and widespread across Oklahoma with an estimated population of 750,000. It is the most popular game animal in the state with an estimated 355,000 hunters harvesting more than 100,000 deer per year. In addition to providing hunting opportunities, many people enjoy watching deer. However, this abundant animal can cause damage issues including deer/vehicle collisions, home garden/ornamental damage, disease transmission and damage to agricultural crops. Crops commonly damaged by deer in Oklahoma include alfalfa, canola, corn, grain sorghum, rye, soybean, sunflower and wheat. This fact sheet will primarily focus on identification and management of deer damage to agricultural crops, but will cover elk, mule deer and pronghorn (antelope) when appropriate as they cause damage in isolated areas of Oklahoma.

Damage Assessment

If you suspect crop damage from wildlife, the first step is to determine which species is causing damage and the extent of damage. A close inspection of the crop often can provide clues to which wildlife species is responsible. Deer lack upper incisors. Therefore, their bite marks are often jagged and uneven. Rabbit damage will typically appear as a clean cut as if made by sharp scissors. Geese pull vegetation also leaving an uneven tear similar to deer. However, geese typically feed in crop fields only during the day and will be visible. Insects also can cause a lot of damage to crops, but they are usually easy to notice during the daytime due to abundant populations. Deer damage most often occurs at night, similar to feral hogs, but feral hogs will typically leave rooting and other soil damage throughout the field. Also, feral hog droppings often appear as large clumps rather than loose pellets as is more typical with deer. Tracks of deer and feral hogs are similar, but deer tend to have more pointed rather than rounded tracks. Deer and elk will sometimes bed in crop fields and you may notice small depressions in the vegetation. Pronghorn typically feed during the day and it will be obvious if they are present. Due to this, they sometimes are assumed to be causing all

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Deer lack upper incisors. This causes a distinct jagged bite on plant parts as shown here.

the damage present in a crop field, but it may be also due to deer and/or elk which are active at night and not observed.

Once you have identified the species causing damage, determine if the level of damage warrants action. Sometimes time spent addressing crop damage is worth far more than the losses of crop yield. Producers often see multiple deer, elk or pronghorn in a crop field and become concerned it will impact profits of the harvested crop. While this may be correct, before assuming this is the case, consider the number of animals observed. Depending on deer body size, it takes about eight adult female deer to equal one animal unit (1,000-pound cow and her calf). Assuming those eight deer collectively eat as much of the crop as one cow each day, it would equal about 30 pounds of dry forage per day. However, deer prefer a diverse diet and rarely consume that much of one forage type in any given day if they have a choice of forage options. Therefore, having good deer habitat with a diverse native plant community is important to help minimize crop damage from deer. To estimate actual crop loss, the field should be inspected across its entirety. Damage is almost never uniform, with damage typically concentrated along the edge of the field and near cover such as trees. Fields with more tree cover around the perimeter will typically have more crop damage. Damage



Grazing exclusion cages are useful to evaluate forage production and wildlife damage. This wheat field is being heavily grazed by deer.

can be extensive in isolated areas of crop fields. However, if this damage is only occurring on a small portion of the field, the total loss may be minimal. Grazing exclusion cages are useful to assess damage in different areas of the field to help make determinations about possible interventions and crop strategies. Grazing exclusion cages can be constructed from cattle panels or woven wire held in place with t-posts. While deer can certainly jump over a cattle panel, as long as the interior width of the cage is less than 6 feet across, deer are not likely to feel comfortable entering the enclosure, so there is no need to put a top over it. Be sure to put the cages in areas where damage is expected (field edges) and also where damage is not expected (field interiors). They need to be put in place after planting but before any damage occurs. If heavy damage is noticed in the interior of a field, geese might be expected, as they tend to avoid field edges. By comparing the crop inside and outside of the grazing exclusion cages, producers can estimate loss and make better management decisions. Having exclusion cages also may be beneficial for determining losses for crop insurance. Discuss this with your farm and ranch insurer.

Crop Selection

The type of crop damaged and when it is damaged is important to consider. Wheat and rye are commonly consumed by deer throughout the winter, but can tolerate fairly heavy grazing during most of the growth period. Susceptible periods are during initial emergence and during the boot stage (if seed is desired). However, deer typically have adequate food during early fall when wheat and rye are emerging, and also in early spring when they are elongating into the boot state. Most deer grazing wheat and rye occurs during November to February. Therefore, these grains can handle fairly high levels of deer damage without impacting grain production. If wheat and rye are used as winter forage for cattle, there may be competition from deer depending on cattle density and native food availability in the surrounding area. Mature wheat and rye are rarely consumed by deer unless it is a beardless (awnless) variety. Rye and triticale are only slightly less preferred by deer compared to wheat. However, unless these grains are growing together, deer use will not likely be noticeably different.

Alfalfa is another crop highly palatable to deer, elk, mule deer and pronghorn and is eaten when available. Similar to wheat and rye, alfalfa can tolerate a fair amount of grazing pressure. But, depending on timing and level of grazing, wildlife damage can reduce alfalfa hay production.

Canola is rarely grazed by deer until after a hard freeze. December through February is the primary period grazing typically occurs. Level of use depends on native food availability in the surrounding area. Deer will normally stop grazing canola as spring approaches and native foods become more available.

Corn and grain sorghum are sometimes grazed during the summer growth period. Grazing during initial emergence is most problematic as it can kill corn plants. Deer also sometimes damage developing ears of corn and sorghum heads. However, this is not typically seen in areas with good deer habitat where native food is available. Native forage is at its highest quality during the spring and early summer and deer are less likely to leave the security of cover to use spring and summer crops unless the crops are highly attractive (e.g. sunflower and soybean). Mature corn and grain sorghum are eaten by deer, particularly later in the winter as native food becomes lower in quality and scarce. Harvesting fields as soon as possible is a good strategy to avoid deer damage to these mature crops. Leaving crops standing late into the winter is risking loss from not only wildlife, but weather including wind and snow.

Sunflower is extremely attractive to deer and can be heavily damaged even when abundant native food options exist. The damage is most notable during early stages of growth and deer will sometimes kill individual plants. More common is that deer eat the terminal bud, causing delayed blooming and reducing seed production across the field.

Similarly, soybeans often are damaged by deer and is perhaps the most problematic crop to grow in areas with high deer density. Deer will consume soybean throughout the entirety of its growth period and continue to consume the pods throughout the fall. Heavy grazing in the early and mid-growth stages can limit bean production. However, light grazing by deer can stimulate pod formation. Damage can be excessive, particularly near forest edges, even when good native food exists.

In areas where deer damage is known to occur, consider planting crops less frequently damaged (such as cotton and canola) or crops that can tolerate high levels of grazing (such as wheat, rye and alfalfa). With crops where mature grain is consumed (corn, grain sorghum and soybean), consider harvesting as soon as the crop is mature to minimize the time it is susceptible to wildlife damage. Many factors are considered when making decisions about crop selection and harvest including commodity prices, rotations, soil type and equipment availability. It is not suggested deer damage take precedence over these considerations, but rather be one of the factors you consider so that the end result is best for your operation.

Habitat Modification

As previously mentioned, deer often damage crop fields along the edges, especially near dense security cover such as trees. Deer do not feel secure in an open field unless they can quickly flee to cover. Rarely do deer feed far into the middle of a large field, except in the dark of night. Use this knowledge to

your advantage. If you have fields near dense cover such as near creeks and rivers, consider planting crops less frequently damaged in these fields or at the margins nearest the cover. Soybeans would not be the best choice in an area where deer feel secure and damage has been frequently observed. Consider removing trees along fence rows and waterways that may encourage deer to venture further into crop fields. Note that tree reduction will not be beneficial when dealing with pronghorn damage as they rarely use trees for cover. Also, removing trees from small crop fields may increase geese use. Be judicious about removing trees and consider other land uses and objectives of your land. Removing trees may reduce the value of the land if you decide to sell it at a later time. It will change the aesthetics, which may not be desired. If you do remove trees from along waterways, be sure to retain and/or establish adequate perennial grass and shrub cover as a buffer to prevent soil erosion. This buffer can be managed for grassland/shrubland wildlife such as bobwhite and pheasant.

For producers who do not wish to remove trees adjacent to crop fields, consider converting the field edges to a native plant mixture including grasses and forbs. Crop production along field edges is typically less than field interiors due to shading and water use from the trees. So, not only are these areas more likely to experience damage, they also are less likely to have high yield potential. Therefore, converting less productive areas of a field to native grass and flowers can, in some cases, be more profitable to the producer than cropping these field edges. There are cost-share options from USDA NRCS that may be able to provide assistance. Further, if the field border is planted in native plants desired by deer, it may reduce deer damage to the crops by encouraging deer to spend time feeding in the border and not in the crop field. Note that for highly desirable crops such as soybean and sunflower, crop damage should still be expected. Talk to the local UDSA NRCS office staff to discuss border widths, planting options and trade-offs specific to your situation.



This field edge was not highly productive due to shading from the forest edge. It was converted to native grasses and wildflowers. Now it acts as a buffer to the soybean field by providing deer with native vegetation on which to feed, while also increasing quail and pheasant populations on the property.

Hunting and Population Reduction

Landowners who experience persistent crop damage should consider hunting as a low- or no-cost option to reduce local deer density and to make deer feel less secure about using crop fields (particularly during daylight). If a producer does not hunt themselves, or does not have family/friends who would be glad to have hunting access, leasing hunting access can be a good option and possibly help offset economic loss due to damage. In Oklahoma, lease rates typically are in the range of \$8 to \$12 per acre per year. Depending on the level of damage, this will often cover crop losses. For example, consider a 200-acre soybean field that yielded 25 bushels per acre and had a 40% loss due to deer damage on 20% of the field. This is a high level of damage, but it is possible. At current soybean prices of around \$9 per bushel, that would equal a total net loss (after input costs of planting and management are accounted for) of about \$2,000. If the field was leased for hunting at \$10 per acre, all crop loss would be covered for that field. While damage levels, commodity prices and input costs vary substantially across the state and across years, this example illustrates how hunting leases can recover crop losses from wildlife damage. Additionally, the above example does not account for the potential for a reduction in crop damage due to a lowered deer population and/or less deer grazing due to the hunting pressure.

Another option for landowners, regardless of whether they lease for hunting or retain it, is the Deer Management Assistance Program (DMAP). This program, administered through the Oklahoma Department of Wildlife Conservation (ODWC) offers landowners more flexibility in female deer harvest and can aid in reducing local deer density to levels that may reduce damage to crops. For information about DMAP, contact ODWC at (405) 385-1791 or <http://www.wildlifedepartment.com/lands-and-minerals/landowner-programs/dmap>. Even if DMAP is not an option or not desired, an ODWC deer biologist can help landowners with recommendations on reducing deer density through hunting. This will typically involve targeting female deer during the regular hunting season. Technical assistance is provided free to landowners and does not carry obligations to take any action. It is important to note that shooting deer outside of the deer seasons is not legal and can result in fines and legal action.

Producers should be aware that it can be difficult to permanently reduce deer numbers on a property. Deer have large home ranges, are able to quickly disperse to new areas and females typically give birth to twins each year. Reductions in deer populations are typically short-lived in a local area, requiring annual efforts that may exceed your tolerance, depending on the level of damage. Partnering with surrounding landowners to form a deer management association may be a good option. Working cooperatively with other landowners with shared goals over a larger area will increase the likelihood of effectively reducing deer numbers and minimizing crop damage.

Other Options

Exclusion in the form of fences can be effective, but is expensive and generally is not a viable option except for protecting extremely high-value crops or small areas such as truck farms or family gardens. Fences need to be at least 10 feet tall to exclude deer. Woven wire is the most effective, but

high tensile wire with 12-inch spacing works as well. Electric fences and multiple parallel fences can provide some damage relief when erected where deer most commonly enter the field. For these fence types, it is important to construct the fence before the crop germinates, encouraging deer to develop daily routines that don't include the crop field. A single electric wire can be used with pieces of aluminum foil (or other electrical conducting material) attached at about 3-foot intervals with peanut butter smeared onto the conductors to serve as an attractant. The resultant shock can condition deer to avoid that area. While this method is not foolproof, it is cheap and easy to try. Another option is a three-wire electric fence with single wire fences placed both 3 feet in front and 3 feet behind. This creates an obstacle deer are uncomfortable navigating through. The obvious drawback to this design is increased construction and maintenance expense, as well as the area occupied by the three parallel fences. While fences are typically cost prohibitive for larger crop fields, they may be a good option for large hay storage sites if elk are problematic.

There are several commercially available and homemade repellants that can provide limited reduction in deer damage. Repellants are classified as either area (smell) or contact (taste). Contact repellants are more effective as they directly coat the plant being protected and therefore deter grazing. Most repellants have been found to provide limited reduction in deer damage. However, repellants which include putrid egg solids or are thiram based have the highest reported effectiveness. A problem with all repellants is they must be applied to a large portion of the plant to provide protection. Additionally, applications must be reapplied frequently, as they degrade in sunlight and are diluted by rain. Expect to reapply every couple of weeks at minimum. Rain will cause more frequent reapplication. Areas with higher deer density and/or lower quality and volume of native food resources will have reduced effectiveness from repellants. Also, the more the crop is preferred by deer, the less effective the repellant will be. While repellants are sometimes recommended for home gardens, repellants are rarely cost effective and are not recommended for crop fields in Oklahoma.

Producers may consider contacting ODWC (405-521-2793 or <https://www.wildlifedepartment.com/law/game-warden-directory> regarding crop damage. The agency will most likely provide technical assistance by discussing the items covered in this fact sheet prior to coming for an on-site assessment. However, in some cases they may be able to offer additional

assistance. For example, propane canons or other loud devices can deter deer and other wildlife from crop fields, especially when used in conjunction with other harassment methods. Scare tactics authorized by ODWC could be particularly helpful when pronghorn are causing damage to crops. Be aware that these loud harassment devices can be annoying to neighbors and are not always a good option.

Summary

Crop damage from wildlife is understandably frustrating and can cause a substantial loss of income. It is hoped the information contained in this fact sheet helps producers assess the cause and amount of damage to their fields. While producers often consider deer population reduction as the first action, it may not be necessary or practical. Producers are encouraged to carefully consider cost/benefits of their actions and also the other objectives of their land before making decisions. Consult with ODWC, USDA, the Noble Research Institute or your local county OSU Extension educator about options best for your situation. Finally, while local deer population reduction may be beneficial in some situations, advocating for large-scale deer population reductions can have unintended consequences to the agricultural community. Deer are a popular game animal for hunters and are highly valued by society. In the U.S., wildlife is owned by the public. Therefore, the public has a vested interest in this shared resource. Most of the public is sympathetic to damage caused by deer in terms of home/landscape, vehicle collisions and agricultural damage. However, advocating for significant reductions of deer across broad areas could lead to resistance. As with any issue, agriculture producers should be prepared to tell their story regarding deer damage in a way the public can understand, while being willing to listen to other groups who may have different perceptions and attitudes toward deer and wildlife in general. This strategy is more likely to lead to mutual respect and healthy dialogue that will enable land management that meets multiple objectives, including the production of crops.

No matter what action is taken to help alleviate crop damage, it will likely not completely eliminate the problem. Deer are adaptable and the need to secure food drives most of their daily activity. However, with thoughtful crop choices, modification of surrounding habitat, hunting, hazing or exclusion, producers will have a greater likelihood of success.

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