Calibrating sprayers
make herbicide applications more effective

Pesticide applications involve more than just putting a glug or two of herbicide into a sprayer.

Critical evaluation of proper calibration, herbicide type, application site, application equipment, and application conditions are all required to ensure proper usage.

Over-application is a common problem with sprayers (for example, a hand or boom sprayer) not properly calibrated. While this article focuses on herbicide application, any equipment used to apply pesticides needs calibrating.

The Goldilocks zone – the right amount

Applying more herbicide than recommended on the label can cause several issues, including wasted money, because less chemical may have been just as effective for the same amount of control. Applying more herbicide does not necessarily kill a plant more quickly than the recommended rate. If a rapid kill is the intention, it may be necessary to research a different type of herbicide or control method. In addition, over-application may cause unwanted injury or death to desired plants. A herbicide selected to target only broadleaf plants may kill grass plants as well if too much herbicide is applied, as seen in in the photo below.

The impact to groundwater is another detriment of over-application. The "extra" herbicide applied due to miscalibration must go somewhere. Groundwater samples taken in Wyoming by the U.S. Geological Survey reveal that "water from wells that were located in urban areas tended to have pesticides detected more frequently than wells located in agricultural areas." See bit.ly/wyo-pesticide-monitoring. Ensure the type and amount of herbicide applied is conducive to the site of application (such as rangeland vs. impermeable driveway).

While over-application can have unintended consequences, so can a sprayer applying less herbicide than desired. Complete control of a plant may not happen if less herbicide is used than the necessary rate. The target plant may appear injured, yet never fully be controlled and result in a second application of herbicide or a different control method. Either of these options require additional time and money compared to a proper initial application.

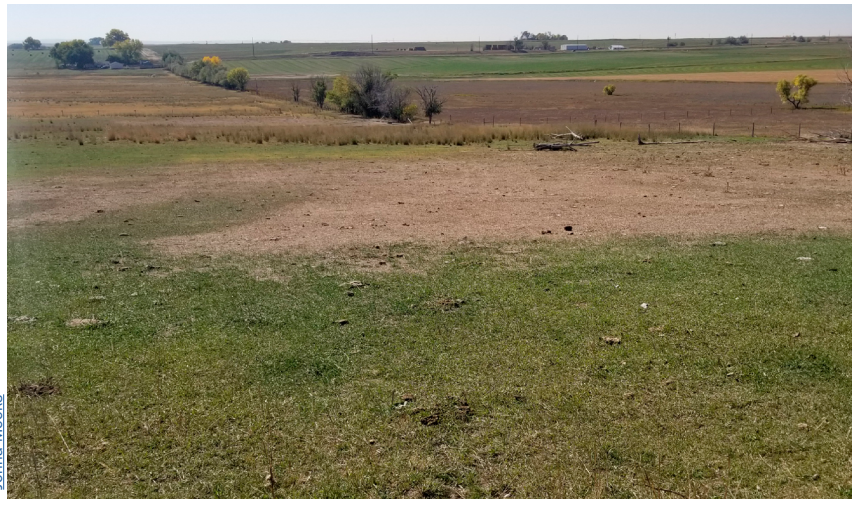
Reduce herbicide resistance possibilities

Improper sprayer calibration can also contribute to development of herbicide resistance in plants. A plant with a slight tolerance to an herbicide can increase its tolerance by continued exposure to that herbicide without a lethal application. Plants have natural tolerances and susceptibilities to herbicides and can be exacerbated by improper application.

Large area versus spot application considerations

It can be confusing translating calibration for a large area or field application when you may be focusing on "spot" treatment. A large area application requires the applicator to move at a consistent pace and a more uniform pattern during the application. A spot application is less consistent and uniform since individual or small groups of plants are targeted and sprayed.

In general, the number and size of droplets that hit a plant when area spraying should mimic spot spraying if using the same calibration rate. If possible, spray clean water on a surface where you can see the droplets (such as on concrete, white paper) to better visualize how much and where the spray hits the "plant." That pattern should match the number and size of droplets applied to a plant when spot spraying.



Jenna Meeks

and saves money

Be sure to target the plant where the herbicide will be absorbed. Leaves generally uptake more herbicide than flowers and stems (unless the herbicide is soil-active).

How to calibrate

Not calibrating your sprayer comes with alarming implications. On the flip side, the act of calibrating your sprayer is quite simple! There are guides, handbooks, phone apps, cheat sheets, online videos, and even specialized equipment to help achieve proper calibration. If using a wand-type sprayer, the 1/128th method is our favorite (partially because the math is done for you!):

- bit.ly/wyo-sprayer-calibration
- uwyoextension.org/ranchtools/sprayer-calibration

A multi-nozzle boom-type sprayer can be calibrated using a similar principle:

- bit.ly/multi-nozzle-calibration

Some sprayers have a "boomless" broadcast sprayer. Follow this example for calibration details:

- Video: bit.ly/atv-boom-calibration
- PDF: bit.ly/atv-boom-calibration-pdf

No two people apply herbicides exactly the same. When using a hand sprayer, one person may walk at a slower pace than another. Over- or under-application of the desired herbicide may occur if applicator differences are not accounted for, making calibration even more crucial.

Principles mentioned here are important for all pesticides, not just herbicide applications. Learn more by reading the "What are pesticides and what does this mean for you?" article in the Winter 2020 *Barnyards & Backyards*.

Calibration is not something to fear as you will likely find that calibration will save time, the environment, and even some money.

Is there a herbicide sprayer calibration rock star list? **Jenna Meeks** would be on it. She is the special projects manager with the Goshen County Weed and Pest Control District. She can be reached at (307) 532-3713 or at gocoweeds@gmail.com.

Mineral rights continued from page 24

income for the federal government. The Department of Interior's Bureau of Land Management (BLM) provides management of all federal mineral rights, including these lying under 58 million acres of private land and an additional 642 million acres under BLM, forest service parcels, and other lands.

To find out if the government precluded the mineral rights on a parcel from being transferred, an interested party can access the BLM website at glorecords.blm.gov/LandCatalog/Catalog and then zoom in on the county, township, range, and section until the patent record for the original settler is visible.

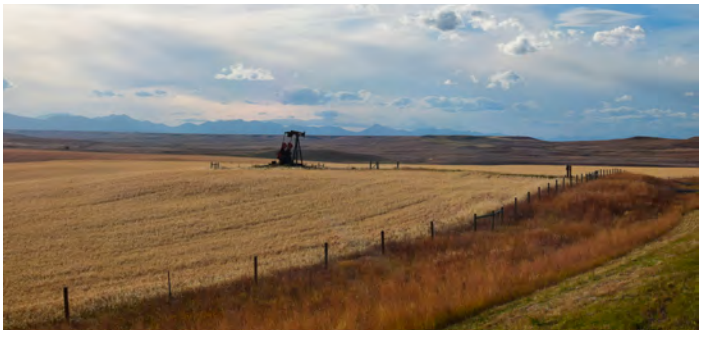
If it has "Coal and other minerals reserved to U.S." then the government owns the rights including sand, gravel, and others. If not listed, the mineral rights may belong to the landowner; however, mineral rights are usually accompanied by a court-recorded "mineral title opinion" to be valid. These are usually connected to the deed or purchase agreement. If not, then someone else, possibly the heirs of the original owner, owns the minerals. Some mineral rights are owned by many people together.

See Wyoming Statutes

Wyoming has a number of mineral right laws, Wyoming Statutes 30-5-101 to 30-5-127 and also 30-5-401 to 30-5-410, which can be found online or by visiting the Wyoming Oil and Gas Commission website at wogcc.wyo.gov.

It should be noted that under the right guidelines individuals can still stake out, record, and work prospector claims in certain locations. Do your homework!

Scott Cotton is a University of Wyoming Extension area extension educator for agriculture, rural living and disaster preparedness. The Cotton family has held land and some mineral rights in the West since 1877. He can be reached at scotton1@uwyo.edu and has additional resources available.



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