

# Effect of Increasing Energy Prices on Irrigation Costs

Tom Dorn  
Extension Educator

Last month I presented tables that showed the increased fuel cost per hour to run various sized tractors and combines and a table showing the increased fuel cost per acre for various field operations given a \$0.40 per gallon increase in the price of diesel fuel. This month I will expand the discussion by showing the effect of a \$0.40 per gallon increase in diesel price on the cost of irrigation pumping. The cost to pump an acre-

inch<sup>1</sup> of water depends on the total head the pump must produce to deliver the water. The total head has two components. The lift from the groundwater in the well to surface and the system pressure measured at the discharge head of the pump. Of course, the greater the volume of water pumped (acre-inches), the greater the cost per acre will be. Table 1 presents several scenarios that represents typical irrigation situations in Nebraska.

<sup>1</sup> Acre-inch is the volume of water needed to cover an acre one-inch deep or 27,154 gallons.

**Table 1. Increased irrigation fuel cost for a \$0.40 per gallon increase in diesel price.<sup>2</sup>**

Irrigation System	Location in Nebraska	Lift, feet	Pressure, PSI	Application Depth, inches	Fuel Cost per acre \$0.90/gal	Fuel Cost per acre at \$1.30/gal	Increased fuel cost \$/acre
Pivot	Eastern	125	35	12	\$20.78	\$30.02	\$9.23
Pivot	Northeast	150	40	12	\$24.37	\$35.20	\$10.83
Pivot	Northeast	150	65	12	\$30.04	\$43.39	\$13.35
Pivot	Central	150	40	16	\$32.49	\$46.93	\$14.44
Pivot	Western	175	40	18	\$40.24	\$58.11	\$17.87
Gated Pipe	Eastern	125	10	15	\$19.23	\$27.78	\$8.55
Gated Pipe	Central	150	10	20	\$29.73	\$42.95	\$13.22
Gated Pipe	Platte Valley	40	10	22	\$12.91	\$18.65	\$5.74
Gated Pipe	Western	150	10	22	\$32.71	\$47.25	\$14.54

<sup>2</sup> Irrigation costs were calculated using Irrigcost, an Excel worksheet written by Thomas Dorn, extension educator, UNL. Irrigcost is available for download at no cost on the Web at: [lancaster.unl.edu/ag/crops/irrigate.htm](http://lancaster.unl.edu/ag/crops/irrigate.htm).

## Watch for Blister Beetles in Alfalfa

Alfalfa producers should be on the alert for blister beetles (*Epicauta spp.*) as they prepare for the next cutting. The increase in blister beetles is likely because immature blister beetles feed on grasshopper eggs, which have been plentiful for the past couple of years. Blister beetles feed on a plant's flowers and leaves, but usually cause little damage. They can create a serious problem, however, for the animals that consume them. Blister beetles contain a lipid (fat) soluble blistering agent called cantharidin, which causes blisters on skin tissue upon contact and can severely irritate an animal's digestive tract, especially horses.

Adult blister beetles vary in size and color but can be recognized by elongated, narrow, cylindrical and soft bodies. When viewed from above, they have a constriction behind the head where it attaches to the narrowed anterior



Gray, black and three-striped blister beetles, all of which are toxic to horses and some other animals to varying degrees. Increased numbers of blister beetles in the second and third cuttings of alfalfa could pose problems for horses and livestock.

end of the thorax. Several species of blister beetles are common to Nebraska and pose varying degrees of problems. In Nebraska, the gray, black and three-striped blister beetles are most common. The three-striped is long, slender, brown and yellowish-gray with yellowish stripes. The gray is a larger beetle that is 9/16-inch to 11/16-inch long. The gray coloring is due to a thick covering of hair. The black blister beetle is the largest of the three species. It is more robust and is 5/8-inch to

7/8-inch long.

Adult blister beetles can generally be found in alfalfa through the second and third cuttings and some years into the fourth cutting. Horses are particularly susceptible to blister beetle poisoning. Part or all of a horse's digestive tract can be severely irritated, leading to secondary infections and bleeding. Cantharidin is absorbed and excreted through the kidneys, thus irritation of the kidneys, ureter, urinary bladder and urethra could be followed by secondary infections and bleeding. The substance also lowers serum calcium levels and causes damage to heart muscle tissue.

Researchers estimate the minimum lethal dose of cantharidin is about one milligram per kilogram body weight of a horse. The lethal dose for cattle may be as low as 0.5 milligram

per kilogram body weight. Consequently, a few beetles with a high cantharidin level would kill a small horse, but quite a few with a low level would be required to kill a larger horse. About 1,700 black blister beetles would be needed to kill an 825-pound horse, but only 120 three-striped blister beetles. However, only 40 three-striped blister beetles would kill a 275-pound colt. As little as four to six grams of dried beetles can be fatal to a horse.

### Management

Toxicosis by blister beetles is related to simultaneous cutting and crimping of hay when beetles are present. If hay is cut with a sickle bar or rotary mower and not crimped, the beetle can leave the hay after it is cut. If the beetles are not allowed to escape, the trapped beetles die and are incorporated

into the hay.

Scout fields, particularly in border areas, for the presence of blister beetles and if found, treat with a short residual insecticide before cutting. Insecticides approved for use on alfalfa can be found on the UNL Department of Entomology Web site.

When selecting a pesticide, read the label to determine harvest restriction intervals. Kansas State University doesn't recommend blister beetle treatment because the dead beetles, which are still toxic, remain in the field. Other recommendations include not using crimpers on hay intended for horses and cutting alfalfa in the bud stage because blooms attract blister beetles.

It is difficult to eliminate the possibility of blister beetles in alfalfa, but carefully examining the hay being fed to horses may help detect their presence.

For more information, read University of Nebraska Cooperative Extension NebFacts (NF02-551) *Management of Blister Beetles in Alfalfa* available at the extension office or online at [ianrpubs.unl.edu/insects/nf551.htm](http://ianrpubs.unl.edu/insects/nf551.htm). (TD)

Source: Jack Campbell, extension entomologist, West Central REC and Keith Jarvi, extension IPM, Northeast REC

## Pesticide Container Recycling

The Nebraska Pesticide Container Recycling program provides a recycling opportunity for plastic from 1- and 2.5-gallon containers. More than 40 inspection/collection sites are available to take your rinsed plastic containers to in Nebraska. Two pesticide container recycling dates have been established in Lancaster County.



The UNL Cooperative Extension in Lancaster County, in conjunction with local businesses, will be holding public collection days from 9 a.m. to 3 p.m. at the following locations:

- July 9 — Farmers Cooperative, Waverly
- July 23 — Farmers Cooperative, Bennet

In addition, the Lancaster County Extension office, located at 444 Cherrycreek Road in Lincoln, will accept containers now through Oct. 31 by appointment during business hours. Call 441-7180 for directions.

All liquid pesticide containers require proper rinsing (triple rinsing or pressure rinsing). Rinse the containers immediately after emptying and place the rinse water in the spray tank for application on the labeled site. It is illegal to burn the containers. Crop oil and adjuvant containers may also be recycled. Please remove caps and plastic labels or multi-layered paper labels.

Commercial applicators are encouraged to recycle their customer's plastic containers at these sites.

Last year, more than 167,000 pounds (83.5 tons) of plastic from pesticide containers were recycled in Nebraska. This plastic is kept separate from regular recycling channels and only goes into environmentally safe uses such as pesticide shipping pallets, agricultural drain tile, parking lot tire bumpers, rail road ties, plastic lumber, etc. (TD)

## New Rules for CRP—Acres Can Be Used for Hay or Pasture

Regulations regarding conservation reserve program fields have changed. Producers now can manage CRP acres as hay or pasture instead of trying to resurrect the fields when it's too late to get much use out of them.

In the past, the CRP fields could only be used on late notice during emergency situations, but studies have indicated more frequent use of CRP for hay or pasture benefits both wildlife habitats and producers. As a result, fields approved by the Farm Service Agency (FSA) and National Resources Conservation Service (NRCS) can legally be swathed or grazed.

The main regulation for

qualified fields is producers either use the entire field every three years or use a third of the field each year. In addition, use can not begin until after a specific date as designated by the FSA.

When beginning to manage CRP acres specifically for forage, first examine the fields. Previously, maintenance was minimal, so fields may contain dead plants unsuitable as forage for hay. If possible, remove this low quality residue so it doesn't mix with and lower the forage quality of this year's new green growth. Any green growth in the first year generally won't be good quality, especially when mixed in with any useless

vegetation.

A prescribed burn, if safe and legal, helps clear-off old growth, weed seedlings and harmful trees. Tougher weeds like thistles, may require herbicides such as Grazon Razon, or 2,4-D and Banvel Granville mixtures. If unsure about how to control certain types of weeds, consult a weed management guide at your local cooperative extension office.

Once a field is cleared of excess growth, consider fertilizing with nitrogen or phosphorus. The growth should respond well to fertilizer, but be sure to evaluate before applying. (TD)

SOURCE: Bruce Anderson, Ph.D., forage specialist