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## Machinery cost calculator helps producers estimate total costs per acre, hour

The Machinery Risk Calculator from RightRisk.org gives producers and custom operators a tool to more accurately estimate machinery and equipment expenses.

To start, go to RightRisk.org and select “Risk Management Tools” from the Resources menu, and follow the link to the Machinery Risk Calculator. A slide presentation and user guide are provided.

Users can enter their own data into the tool for such factors as acres per hour, size, and others, or they can use the data in Table 7 of the tool.

Click on the Click Here to Begin button to advance to the Navigation tab, and select the number of implements to analyze; in our example, we selected

Powered Equipment. Information is entered about the machine on the Power Unit tab. Table 4 of the tool’s appendix can make these entries easier by providing data, as reported by the American Society of Agricultural and Biological Engineers, for expected life, repair factors, cost factors, and lifetime repair and maintenance costs as a percentage of the list price.

Next, move to the field operation tab and enter size and field efficiency of the equipment. Costs of inputs, operator labor, and return to management are entered in this step.

After making the entries to define the equipment and associated costs, choose a cost factor to see the implications of risk on final estimates.

### Wyoming Example

In the previous installment in this series, we began with an example producer looking to determine the operating cost for swathing hay with a used self-propelled windrower. Using information under the Operations tab (Table 7 in the appendix of the tool), we found the median values from previous custom rate surveys to be 94 horsepower, 14 feet (harvesting width), and 56 acres covered per 10 hours of use (Figure 1). The data on the power unit page includes cost and repair factors for the windrower found in Table 4 of the tool.

Moving to the Field Operation tab, enter the data from the Operations tab tables and the resulting 5.6 acres per hour of use. Note the reported overall efficiency of 80

RightRisk.org provides resources to assist producers in all stages of risk management planning, including producer profiles, budgeting, and other risk management tools and courses.

percent found in Table 5 is higher than the median value reported in Table 7. Using the 66 percent efficiency estimate from Table 7 gives the 5.6 acres-per-hour accomplishment rate.

Operator labor is entered as \$20 per hour and the return to management at \$0 per hour. Once

the data has been entered, the tool generates a results table (Figure 2).

The Machine Risk Calculator estimates a total cost per hour of \$42.21 or a total cost per acre of \$7.54.

Further analysis using the Machinery Risk Analyzer can be performed using the risk analysis section, showing risk sensitivity to variations in costs, such as fuel and oil per hour.

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Figure 1. Windrower Information Field Operations Tab

| ESTIMATED ANNUAL COSTS AND COST PER HOUR |              |            |         |          |       |         |            |            |         |          |        |         |            |
|--|--------------|------------|---------|----------|-------|---------|------------|------------|---------|----------|--------|---------|------------|
| Annual Use Hours                         | YRS TO TRADE | TOTAL COST | DEPR    | OPP COST | THI   | REPAIRS | FUEL & OIL | TOTAL COST | DEPR    | OPP COST | THI    | REPAIRS | FUEL & OIL |
| 150                                      | 20.0         | \$6,332    | \$1,918 | \$1,020  | \$516 | \$1,215 | \$1,663    | \$42.21    | \$12.79 | \$6.80   | \$3.44 | \$8.10  | \$11.09    |

Figure 2. Example Self-Propelled Windrower Cost Summary Table

## Take care feeding lawn clippings to livestock

Lawns are the largest “crop” in the U.S.

In 2005, NASA estimated lawns covered over 40 million acres of U.S. soil. Most lawns in Wyoming are some combination of Kentucky bluegrass and fescue.

We spend a lot of resources fertilizing, watering, and mowing our lawns.

Is there any value in all of that grass?

Many people successfully feed grass clippings to cattle and sheep, either fresh or ensiled. This is not without risk.

Never feed grass clippings to horses. Because of the short fiber length, most lawn grass clippings will pass through the digestive system very quickly. A pile of fresh grass clippings is too tempting to resist, and most horses would gorge themselves given the opportunity. Both of these factors can lead to excess fermentation in the hindgut and colic. Horses are also susceptible to botulism, which can develop in anaerobic conditions (a pile of grass clippings).

### Avoid Nitrate Toxicity

Cattle and sheep have a different digestive system and are not at risk of colic or botulism. That does not mean throwing grass clippings into the feed bunk is always a good idea.

**Nitrate** toxicity is a risk with many forages, including grass clippings. Bacteria in the guts of ruminants convert the nitrate in forage into ammonia, which is used to make protein for bacterial growth and reproduction. **Nitrite** is produced as an intermediate compound created in this process and can inhibit the ability of the blood to transport oxygen. Toxicity depends on the nitrate concentration of the forage and rate of consumption. For example, an animal that consumes high nitrate forage quickly is more at risk of poisoning than an animal that consumes this same forage over a longer period of time.

Excessive nitrates will most often accumulate in the stalks or stems of plants under stress. Stress-



ful conditions include drought or cold weather, herbicides, and disease. While levels of nitrogen in the soil are also a factor in nitrate accumulation, it is not as important as plant stress.

Allowing fresh grass (green chop or grass clippings) to heat up before feeding greatly increases the levels of toxic **nitrite** (due to bacterial activity in the pile) and can turn an otherwise safe feed deadly.

Considering this, the highest risk of nitrate toxicity from grass clippings would come from a heavily fertilized lawn under stress that was stored in a pile and allowed to heat up before feeding and then

was consumed quickly by livestock and not mixed with other forages.

If concerned about the nitrate concentration of your lawn grass, or any other forages, send a sample into a lab for analysis. It will cost less than \$20. Grass high in nitrates may still be fed if mixed thoroughly with other feeds.

### Ensiling Preserves Nutritional Value, Lowers Nitrates

Ensiling forages can reduce nitrate levels by 40 to 60 percent; however, testing the silage for nitrates before feeding is still a good idea.

Ensiling is a way of storing forages in anaerobic conditions (no oxygen) that preserves their nutritional value. Bacteria ferment the sugars and starches in grass and produce lactic and acetic acids. Successful ensiling requires grass that has a moisture content of 60-70 percent and a sealed environment that excludes oxygen. After several weeks of fermenting, silage should have a pH below 4.5, a slight vin-

egar odor, and be light green to yellow in color.

Pesticides and poisonous plants are other considerations when feeding grass clippings to livestock. If the area where you are collecting clippings has been sprayed with any pesticides, **thoroughly read the label** to determine if the grass is safe to feed to livestock.

There are many plants poisonous to livestock. If you mow an area with heavy weeds, tree leaves, or pine needles, putting that load in the compost pile instead of the feed bunk may be best.

For more information about feeding grass clippings, including nitrate toxicity and making silage, visit [www.uwyoextension.org/drcatlin](http://www.uwyoextension.org/drcatlin) and click on Hot Topics.

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