

2017 YOU SHOW US CONTEST

CATTAIL SLAYER

COUNTY: Steele County in North Dakota

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PROBLEM STATEMENT:

Cattails near the roadside were creating visibility issues for the motoring public. They also made it more difficult for drivers to see deer and other wildlife in the ditches. During the winter, the cattails act as a barrier causing snow to accumulate on the road and create snowdrifts.

SOLUTION:

Design a hydraulic motor belt-driven sickle mower capable of cutting cattails and small trees up to 21 feet from the roadside and at a 45-degree angle into the sloped ditch.

A three-point mount is used to attach the cattail slayer to a tractor. Two pulleys and a cable are used to pivot the mower on the fulcrum. This transmits torque and enables the sickle bar to slant to a 45 degree angle so the cattails can be cut close to the ground in the sloped ditch. The pulleys and hydraulics are used to raise and lower the sickle. The pulleys are designed to allow the sickle bar to bounce over rocks or other objects. The pulleys, cable and hydraulics are needed due to the long stroke. The sickle bar is reinforced along its entire length with tubing to prevent bowing. The sickle mower is mounted on swivel plate so the sickle bar may be moved and secured behind the tractor when in transport mode. The last 5 feet of the sickle bar is painted red so the end of the sickle is more visible to the operator and other motoring public. When in transport mode, a flashing beacon is mounted on end of the sickle.

LABOR, EQUIPMENT AND MATERIAL:

The following equipment was used:

Welder, chop saw, plasma cutter, acetylene torch

The following materials were used:

73" - 3x3" square tube

24" - 4x4" square tub

254" - 5x5" square tube

123.5" - 2x2" square tube

66" - 1x2" tube

93" - 1.5x2.5" tube

106" - 1.5x3" tube

120" - 2x6" tube

21' - sickle section length from John Deere swather

10" - 3/4 x 4" flat iron

12" - 3/4 x 5" flat iron

54" - 3/4 x 6" flat iron

222" - 1/8 x 6" flat iron

43" - 1/2 x 2" flat iron

70" - 3/4" 3 x 3' plate

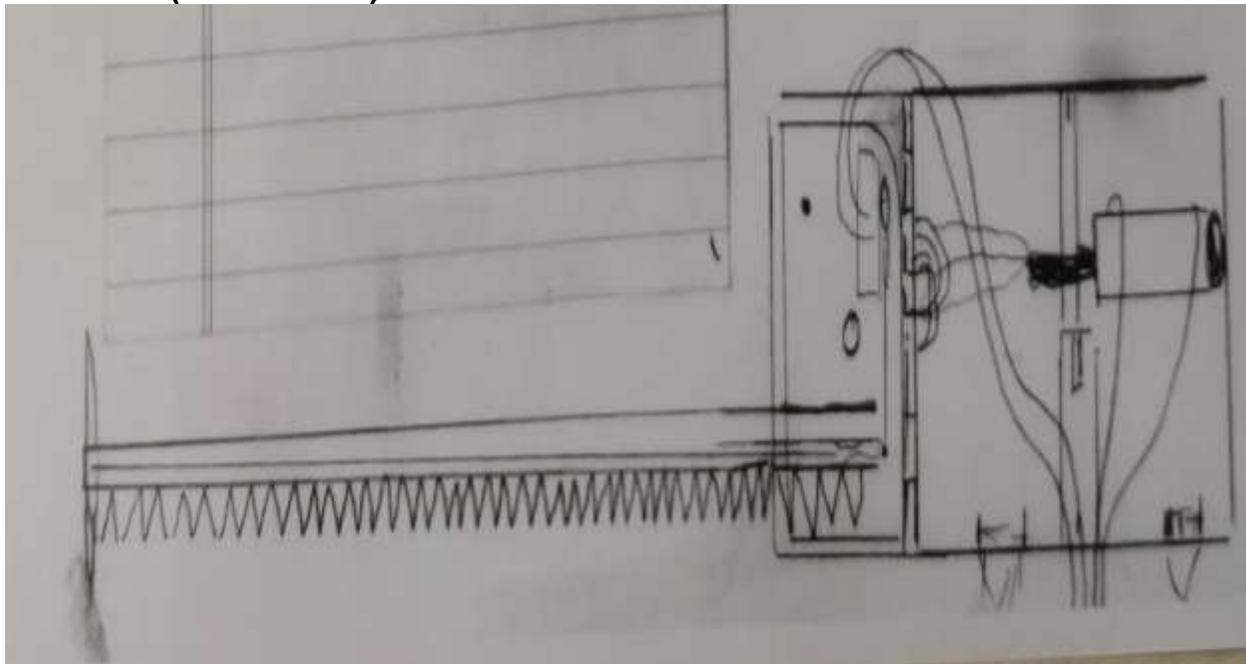
4 - 1/2 x 8" pulleys

Bolts.

Total labor hours: 2 employees. Approximately 140 hours

(Note: this includes time for design, discussion, and modifications)

DRAWING (SCHEMATIC) WITH DETAILS



COST SUMMARY:

Sickle section length from John Deere swather – free

Square tube - \$516.21

Tube - \$207.18

Flat iron - \$134.90

Plate – 390.53

Total cost - \$1,248.82 plus labor

SAVINGS AND BENEFITS (*monetary and/or safety related*):

The County Road Department has experienced a savings in time, money, and manpower with the cattail slayer. Snowplowing is needed less frequently on roads where the cattails have been cut. The snow blows across the road and into the ditch instead of accumulating on the road. Snowplow drivers are able to focus on other areas of the county's road system.

Motorists are better able to see oncoming vehicles and wildlife. Now, with greater visibility, motorists are better able to take preventive measures to avoid accidents with deer or other wildlife. At intersections and on curves, better visibility is provided to motorists, thus creating a safer road system.

Fabricated frame for cattail slayer to attach to tractor.



Pulleys and cable (with hydraulics) allow the bar to easily pivot on the fulcrum to transmit torque. The cable and pulleys are also use to lift the bar when going around road signs.



Sickle bar fully extend....in design mode.



Cattail slayer in action.



Slayed cattails on road shoulder.



Transport mode.

