

Students please affix one of yourself adhesive identification labels to this space. Do not obscure other parts of this page with the label. If you do not have a self adhesive identification label, please complete the following information. Write your name as it appears on your badge.

Your Name: _____

Students please do not write or mark within this box.

Judges, after this skill sheet has been scored and double checked, write the total score for this activity in the blank below.

Participation Number:

Two letter state abbreviation. →

State code (0301, 0302, to 0350)

Team member number (01, 02, 03, or 04)

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Skill Activity Score: _____

Judges Initials: _____

**2016 NATIONAL FFA AGRICULTURAL TECHNOLOGY AND MECHANICAL SYSTEMS
CAREER DEVELOPMENT EVENT
MACHINE AND EQUIPMENT SYSTEMS
INDIVIDUAL SKILLS/PROBLEM SOLVING ACTIVITY**

There are multiple parts to this activity! Please read and follow all directions carefully! Use your time wisely!

GENERAL INFORMATION:

As a farm manager, understanding the fundamental growth cycles of the crops you grow, the methods for harvesting, processing, and storing these crops as cattle feed, and how cattle process various feed types are imperative to the health of your herd, as well as affecting rate of gain or the production of milk.

For this skill activity, you will be using the New Holland F240 or the Case-IH FHX300, pull-type forage harvester. Both machines are identical in design and function.

This skill activity is worth a maximum of **30 points**. You will have **25 minutes** to complete the skill activity. Read through the instructions and procedures carefully before you begin. **(If you don't know if it is OK- Ask before you do it!)**

PROBLEM STATEMENT:

You are the farm manager for a 350 cow dairy, producing Class I milk for a local farmers' cooperative. As part of your job responsibilities, you are assigned to direct the fall harvest and the subsequent storage of field corn cut for silage for the herd.

Each cow consumes 25 lbs. of corn silage/day over a 365-day year, as part of their total ration. The corn crop is ready for harvest and corn silage chopping is about to begin. The chopping crew will work consecutive 10 hour days until the crop is completed.

Your equipment inventory for this job consists of the following items:

1 – 500 HP articulated FWD tractor, equipped with dual wheels/ tires, front dozer blade, and ballasted to a machine weight of 60,000 lbs.

1 – 300 PTO HP Front Wheel Assist tractor, with 1000 RPM PTO

1 – pull-type forage harvester, equipped with 6 cutterhead knives, a separate blower to move chopped crop from the harvester into the accompanying forage dump wagons, and a 3 row narrow corn head.

3 – pull-type forage dump wagons, 18' long, 8' wide, with 7' sides, attached to 12 ton running gear

3 – 130 PTO HP tractors, used for pulling the forage boxes

The corn crop has been previously field evaluated, and is estimated to yield 20 Tons/Ac. The crop will be chopped at a $\frac{3}{4}$ " average particle length. The dump wagons will be pulled by tractors alongside the forage harvester, to minimize downtime exchanging wagons in the field as they are filled. The crop will be dumped at one or more pit (bunker) silos (550-ton capacity each) and then pushed into the pile and packed by the articulated tractor.

The average round trip time for one tractor and wagon to travel between the field and the bunker silo dump location, dump the load, and return to the field, is 30 minutes. The theoretical (100%) field capacity of the forage harvester when harvesting corn silage is 60 tons/hr. Corn silage carried in the wagons between the field and silo dump weighs 25 lbs./cu. ft. Properly packed silage in the silo weighs 35 lbs./cu. ft.

INSTRUCTIONS:

1. Read the instructions for this skill activity and review all the handouts.

2. Use all required Personal Protection Equipment. **This means wear your safety glasses!**

2. Using the provided handouts, scratch paper, your calculator, and all the associated questions, answer the following questions. Round up to the hundredth decimal place unless noted.

Questions:

1. The chopper was previously used to harvest a different crop at a different average particle cut length setting. You must determine at what length-of-cut (LOC) the machine was previously set, then reset the chopper to obtain the desired $\frac{3}{4}$ " length of cut needed for this operation.

a. List the model number and serial number of the chopper you are inspecting:

Station #: _____

Model: _____ (1 point)

Serial Number: _____ (1 point)

b. List the current crop length-of-cut setting: _____ (2 points)

c. List the sprockets required to set the chopper to $\frac{3}{4}$ " LOC:

Drive: _____ tooth (1 point)

Driven: _____ tooth (1 point)

d. Change the LOC sprocket setting on the chopper, if needed, to properly set the machine to the desired particle cut length.

_____ Yes or No (3 points)

2. The blower fan on the chopper base unit needs to be checked for proper clearance adjustment to maintain optimum blowing efficiency. Inspect the clearance between the blower fan paddle and the blower band to determine if the paddles require adjustment.

a. To what clearance should the paddles be set for optimum blower efficiency?

_____ (1 point)

b. Where is this measurement checked on the blower?

_____ (1 point)

c. What is the paddle-to-band clearance measurement on the unit you are inspecting?

_____ (1 point)

3. The chopper uses different heads for picking up and feeding the crops into the machine. Currently, the corn head has been installed. Determine if the corn head auger speed matches the harvester base unit length-of-cut setting, in order to match the speeds between the header and the base unit, preventing header plugging. Inspect the header auger and chopper base unit drive sprockets and determine:

a. What header auger speed sprocket is presently installed on the corn head?

_____ tooth (1 point)

b. What header auger speed sprocket is required to match the header auger speed to the desired base unit length-of-cut speed?

Head drive sprocket: _____ tooth (1 point)

Chopper base unit drive sprocket: _____ tooth (1 point)

4. How many tons of corn silage must be chopped to satisfy the requirements of the herd on a yearly basis?

_____ tons (4 points)

5. How many bunker silos are required to satisfy this storage requirement?

_____ No. of silos (3 points)

6. How many acres of corn must be harvested to fill these silos?

_____ Acres (3 points)

7. At 85% field efficiency for the chopper, how many days will be required to harvest the crop?

_____ No. of Days (4 points)

****Official Use Only ****

Student Use of Safety Glasses _____
(1 point)

Total Points Earned _____
(30 points maximum)