

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:

**2023 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:

The proper selection of nozzle type and size is the most important part of pesticide application. The nozzle determines the amount of spray applied to a particular area, the uniformity of the applied spray, the coverage obtained on the sprayed surfaces, and the amount of drift.

For this exercise, we will be using a John Deere Sprayer, Model 412R. As a farmer, you are very concerned about minimizing spray drift and are looking to select a nozzle size that will meet the operation criteria below while selecting a nozzle type for optimizing drift control.

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 a farmer in Wisconsin that raises corn and soybean. To combat weeds within your corn crop that suffers from dense weed/crop canopies, you will be applying Resicore XL herbicide, using your John Deere Sprayer- Model 412R, at the maximum recommended herbicide application rates. Due to medical issues and poor weather conditions, you haven't had an opportunity to spray your cropland until today. Based on proper weather conditions and your upgraded health status, you will apply a single maximum dose of Resicore XL herbicide (preemergence).

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.

Application Information:

Application rate and application pressure is found in herbicide information. Use the maximum recommend pressure for the selected herbicide

Questions:

Herbicide and Spray Tip Technical Questions

1. For corn, what is the maximum recommended application rate of Resicore XL herbicide (preemergence) per acre? (1 point)

_____ fl. oz. / A
(1 point)

2. Based upon the size of the spray tank on the John Deere 412R sprayer and the maximum strength recommended application rate of the Resicore XL herbicide (preemergence), how many acres can you spray with one tank of herbicide mixture?

_____ A
(2 points)

3. Using the TeeJet Catalog, the application information, and the three spray tips on your table, indicate the flowrate (GPM) per nozzle and droplet size. (1 point each, 9 points total; **PLEASE PRINT LEGIBLY**)

Spray Tip Color	Part Number	GPM	Droplet Size
Red			
Purple			
Green			

Herbicide and Spray Tip Technical Questions (continued)

4. What is the recommended psi for the tires used on this sprayer when the tire load is 13,780 lbs.? _____ psi
(1 point)

5. Assume this sprayer is stored in an unheated machinery shed throughout the Wisconsin winter (average low temperature is 1 degree F.) What percentage ethylene glycol is the minimum you should use in this engine? _____ %
(1 point)

Sprayer Calibration

6. Using the Tee Jet Calibration Container, determine the output of each type of spray nozzle tip installed. A student volunteer will serve as the timekeeper. Determine the spray nozzle flow rate in Gallons per Minute (GPM) and Ounces Per Minute (OzPM). Use decimals at the thousandth place if needed. You will collect a sample for 30 seconds for each nozzle. (1 points each, 6 points total)

Spray Nozzle	OzPM	Nozzle Suitable for use with selected herbicide?
Red		
Purple		
Green		

7. Identify the following components on the John Deere 412R Sprayer. Print legibly the common name of the component in the space provided. (1 point each, 4 points total)

Component A _____

Component B _____

Component C _____

Component D _____

8. Calculate the Theoretical Field Capacity of this sprayer. Assume you are spraying at the maximum spray speed range.

_____ TFC
(2 points)

9. Assume your operator is 75% efficient when spraying. Using the maximum spray speed range, now calculate the Effective Field Capacity of this sprayer.

_____ EFC
(3 points)

******Official Use Only ******

Student Use of Safety Glasses _____
(1 point)

Total Points Earned _____
(30 points maximum)