WRITTEN CALIBRATION PROBLEM

PROBLEM #1

Given:

Aircraft:	Cessna Ag Husky
Airspeed:	110 MPH
Nozzle type:	Spraying systems disc core hollow - cone nozzle
Swath width:	60 feet
Nozzle spacing:	40"
Number of nozzles:	18
Nozzle pressure:	40 PSI
Flight altitude:	40 feet
Spray volume:	2 GPA
Lasso rate:	3 qt/A

Questions:

1. How many acres per minute are being sprayed?

2. How many gallons per minute are required to apply 2 GPA?
_____GPM

3. What nozzle flow rate (GPM/nozzle) is required to apply 2 GPA with the aircraft? _____GPM/nozzle

4. How many ml of Lasso is needed per gallon of spray solution?
_____ml

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PROBLEM #2

Given:	Sprayer:	300 gal tank 30 nozzles 20 inch nozzle spacing Output 5 GPA
	Herbicide:	Ally (metsulfuron 60% ai) Rate 1/10 oz/A
	Calibration test:	Traveled at 6 MPH for 35 sec

Questions:

1. What is the boom width? _____ft

2. During sprayer setup, what size nozzles must be on the sprayer to attain 5 GPA at 6 MPH? _____GPM/nozzle

3. When the sprayer is properly calibrated, how much Ally should be added to make 300 gal of spray solution? _____oz

4. What distance is travelled during the calibration test? _____ft

5. How much water should be collected from all the nozzles during the calibration trial, when the sprayer is calibrated perfectly? _____quarts

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PROBLEM #3

Given:		
	Fusilade 1E	0.2 lb/A ai
	Basagran 4E	0.75 lb/A ai
	Blazer 2L	0.125 lb/A ai
	Crop Oil Conc.	1 qt/A

Calculate the quantities of each material needed to spray 35 acres of soybeans in a carrier volume of 15 GPA.

Questions:

1. Amount of Fusilade needed: _____gal

2. Amount of Basagran needed: _____gal

3. Amount of Blazer needed: _____gal

4. Amount of COC needed: _____gal

5. Amount of water needed: _____gal

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PROBLEM #4

A chemlawn applicator has determined that he wants to apply Buctril at 0.4 oz/1000ft^2 to control prostrate spurge in a clients lawn. Calibrate his sprayer: XR 8002, flat fan nozzles on 20 inch spacing. He likes to walk 100 ft in 30 seconds. The lawn is 41,000 ft^2

Questions:

1. What is the output GPA?

2. What output should he receive from each nozzle?

3. How much solution (ml) should he receive from each nozzle in 20 seconds?

4. What is the desired pressure for the nozzles to deliver this volume of spray solution?

5. The spray tank holds 3 gallons of water. How many times will we need to fill the spray solution?

6. How much Buctril is needed in each tank?

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PROBLEM #5

A chemlawn applicator has determined that he will apply 0.33 ai lb bromoxynil to a turf area 70 feet by 90 feet using a hand held boom sprayer with four nozzles spaced on 20 inch centers. He wants to apply the herbicide solution at the equivalent of 20 GPA and he has determined his walking speed to be 3 MPH.

Questions:

1. He has the choice of using either 8002VS standard flat fan nozzle or TK-VS5 floodjet nozzles. Which nozzle type should he use? Why?

2. Calibrate his hand held boom sprayer. What output should he receive from each nozzle?

3. How much solution (ml) should he receive from each nozzle in 10 seconds?

4. What is the desired pressure for the nozzles to deliver this volume of spray solution?

5. Before his application, he decides to increase his output to 25 GPA in order to achieve more thorough coverage. What should he adjust his pressure to in order to achieve this output?

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PROBLEM #6

The applicator in problem 5 wants to calibrate his walking speed so he marks a 50 ft length. If he wants to walk 3 MPH, how long (in seconds) should it take him to walk 50 feet?

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PROBLEM #7

Given: 500 gallon tank
36 nozzles, 20-inch spacing
10 GPA at 7 MPH
Classic (75% chlorimuron ethyl a.i.)
Rate = 0.5 oz. Classic per acre
Traveled 32 seconds for calibration run

Questions:

1. What is the boom width? _____feet

2. How much chlorimuron ethyl is applied per acre?
_____oz

3. What distance is traveled during the calibration run?
_____ft

4. A calibration run indicated 9 GPA output. Adjusting travel speed to attain the desired output of 10 GPA, would result in a new travel speed of _____ MPH.

5. After setting the proper calibration, how much Classic should be added each time the spray tank is filled? _____oz

WRITTEN CALIBRATION PROBLEM

PROBLEM #8

Given:

Sprayer:	4-row, 40-inch row width planter sprays a 13-inch band two, 150-gallon saddle tanks 20 GPA 5 MPH
Herbicide:	Alachlor 2 lbs/ac linuron 1.5 lbs/ac
Field size:	200 acres

Questions:

1. What is the flow rate in gallons/minute from each nozzle?
   _____GPM

2. How many total gallons of spray solution is needed to treat the entire field?
   _____gal

3. How many quarts of Lasso 4E and pounds of Lorox 50W will be added to each tank at each fill?

   _____quarts of Lasso 4E

   _____lbs. of Lorox

4. How many gallons of Lasso 4E and pounds of Lorox 50W will be needed to treat the entire field?

   _____gallons of Lasso

   _____lbs. of Lorox

5. If Lasso costs $16.70 per gallon and Lorox costs $4.60/lb., what is the total cost of herbicide on this field?

   _____dollars

WRITTEN CALIBRATION PROBLEM

PROBLEM #9

Given:	Sprayer:	CO_2 backpack 10 ft. boom 3 gal. tank
	Herbicide:	bromoxynil 2 lbs/gal rate 0.33 lbs/ac
	Turf area:	20' X 300'
	Calibration:	1/2 gallon of water is applied in 100'

Questions:

1. How much technical bromoxynil will be needed to treat the entire turf area? _____grams

2. How many gallons per acre is the sprayer applying? _____GPA

3. How many gallons of solution is required to treat the entire area? _____gals

4. How many milliliters of bromoxynil are required per gallon of solution? _____mls

5. If walking speed is 2.5 MPH, approximately how long will it take to spray the entire area? _____min _____sec

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PROBLEM #10

Our sprayer pressure gauge (mounted beside the spray operator) is set at 25 psi. The present output per nozzle is 0.17 gallons per minute. We would like to have an output of 0.2 gallons per minute using teejet nozzles.

Questions:

1. How should we adjust the pressure to achieve the correct output?

2. What should the new pressure reading indicate (give the numeric value)?

3. How many mls should he collect from each nozzle in 20 seconds for the correct calibration?

4. The applicators want to calibrate their travel speed to 6 MPH. They measure a distance of 200 ft. How long should it take them to travel this distance?