TORO®

Commercial Products

Toro Sprayer

Calibration Tool

User Guide
&
Installation Instructions

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Introduction

To accurately calibrate the sprayer the Spray technician or the Superintendent must be able to verify the following:

- What the sprayer is putting out.
- How consistent each and every nozzle on the sprayer is.
- Calculate the proper amount of product to add to the water.
- How much water is required to cover the desired area.

To assist in the sprayer calibration process the Toro Sprayer Calibration tool has been developed,

This program will allow the spray technician or the superintendent to quickly and accurately check the performance of the sprayer and also calculate the desired application rate, product to water ratio and the amount of water needed to cover the desired area.

This booklet will explain the functions of the program and the information that it will provide.

Windows® PC

Installation Instructions

Down load the ToroSprayers.exe file
Double click on the file to unzip.
        The files will be unzipped into the directory where you downloaded the file.
Double click on setup.exe
This will install the program on your computer.

Starting the Program

Click on "Start" on the Windows® toolbar.
Click on "Programs".
Click on "Toro Sprayers".
Click on "Toro Sprayers" to Start the Program.
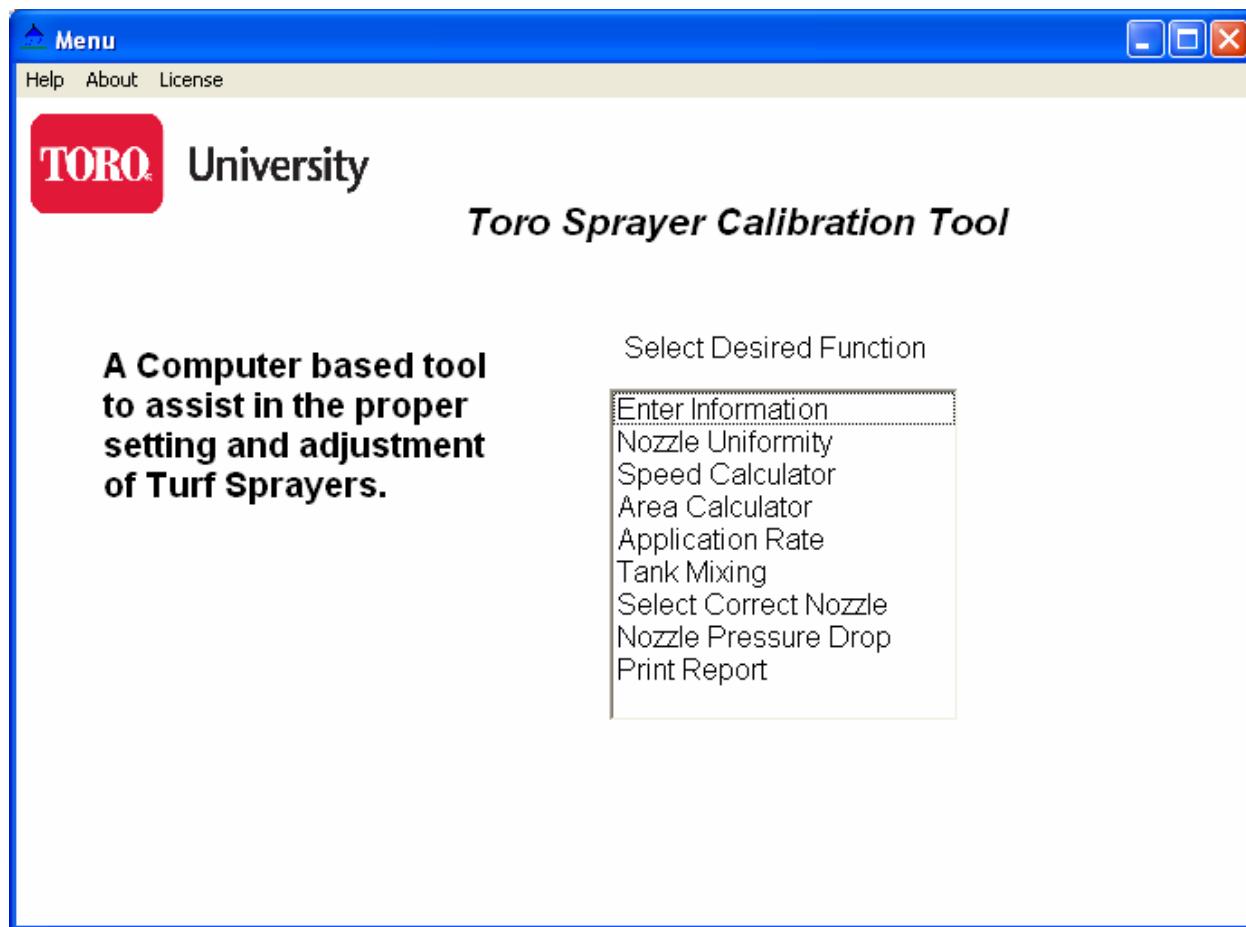
Toro Sprayer Calibration Tool
**Program Instructions**

From the main menu screen select the desired function.

Select from the following program functions:
1. Enter Information
2. Nozzle Uniformity.
3. Speed Calculator.
4. Area Calculator
5. Application Rate.
6. Tank Mixing.
7. Select Correct Nozzle.
8. Nozzle Pressure Drop.
9. Print Report

Enter Information

This screen allows the user to enter information that will be included on a report that can be printed at the end of the calculations.

There are areas to enter the following information.
1. Company Name
2. Address
3. Phone Number
4. Date
5. Applicator Name
6. License Number
7. Product Applied
8. Additional Notes

Nozzle Uniformity

The purpose of this program is to check the accuracy of the individual nozzles to be sure that they all fall within the entered variation percentage.

If the output of any of the nozzles is too high or too low, the program will indicate which nozzles do not fall within the acceptable range.
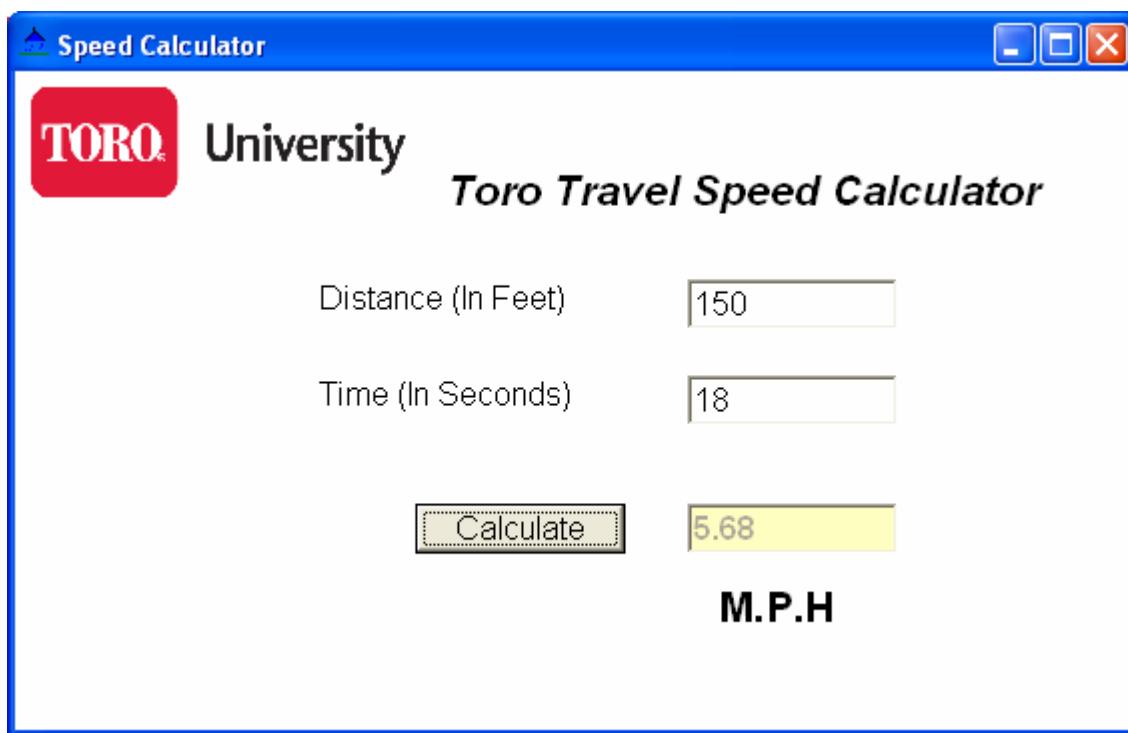
The program will also calculate the actual output in GPM that the sprayer is delivering.

This is used to compute the actual sprayer application rate in the later screens.

1. Nozzle Uniformity
    a. Enter the allowable Nozzle Variation Percentage.
        i. Usually 5 to 10%
    b. Enter the Catch time in Seconds.
        i. Used to calculate the GPM per Nozzle
    c. Enter the pressure used in the Nozzle Catch test.
    d. Enter the ounces caught per nozzle(In ounces)
        i. Enter an amount for each nozzle on your sprayer.
        ii. Program will determine how many nozzles you have on the sprayer and calculate the average output per nozzle.
    e. Press Calculate.
        i. The program will return the Average Output for the Nozzles.
        ii. The maximum allowable output and the minimum allowable output.
        iii. The program will also flag the nozzles that do not fall between this range.
        iv. The program will also calculate the GPM per nozzle for use in the Application rate calculations.

Speed

To calibrate the sprayer the actual speed that the sprayer is traveling is needed. This speed number is used for the later calculations to calculate the actual application rate.

1. Speed Calculator
   a. Enter the distance traveled in feet.
   b. Enter the time in seconds to travel the entered distance.
   c. Press Calculate.
      i. This will display the MPH that you were traveling.
      ii. This is needed for the Application rate calculation.

Area Calculator

To calculate area of a specific shape, select the desired shape from the drop-down box.

1. Area Calculator
   a. Enter the requested Distance(s) in feet.
   b. Press Calculate.
       iii. This will display the Area in Square feet.
       iv. This will display the Area in Acres.

Application Rate

Now we will calculate the actual application rate that the sprayer is delivering.

1. Application Rate
   a. The program will pull the GPM from the previous screen and enter it in the Gallons per Minute field.
      i. This can be changed if you desire.
   b. The program will also pull the MPH number from the previous screen.
      i. This can also be changed if desired.
   c. Enter the nozzle spacing of your sprayer.
      i. Standard on Toro sprayers is 20 inches.
   d. Press Calculate and the program will display application rate in both Gallons per 1000 SqFt (G.P.K) and Gallons per Acre (G.P.A)

Sprayer Calibration (Tank Mixing)

To calculate the actual amount of water and product needed to cover the desired area, enter the desired application rate for the product and the actual application rate for the sprayer. The tank-mixing screen will perform the appropriate calculations.

The program will display the amount of water required in gallons to cover the entered area. It will also display the amount of product required in ounces and gallons.

1. Tank Mixing
   a. Enter the product application rate.
      i. This is ounces of product per 1000 Square feet.
   b. Enter the Sprayer Calibration rate.
      i. In gallons per 1000 Square feet.
      ii. This should be per the manufactures recommendation.
      iii. This should also be the actual amount of water that the sprayer sprays.
      iv. If needed you can convert Gallons per Acre to Gallons per 1000 Square feet by using the "Convert G.P.A. to G.P.K button.
   c. Enter the area to be sprayed.
      i. Either in 1000 Square feet.
         1. Entering 50 = 50,000 square feet.
      ii. Or Acres.
         2. The program will convert it to 1000 Square feet.
   d. Press calculate.
      i. The program will display the ounces of product to be mixed per gallon of water.
      ii. The program will also display the total amount of water needed to cover the enter area.
      iii. The program will also return the total amount of product required in both gallons and ounces.
   e. If the total water required is larger then the capacity of the sprayer tank then press "Multiple Tank Mix"
      i. This will calculate the quantities of water and product for each individual tank fill.
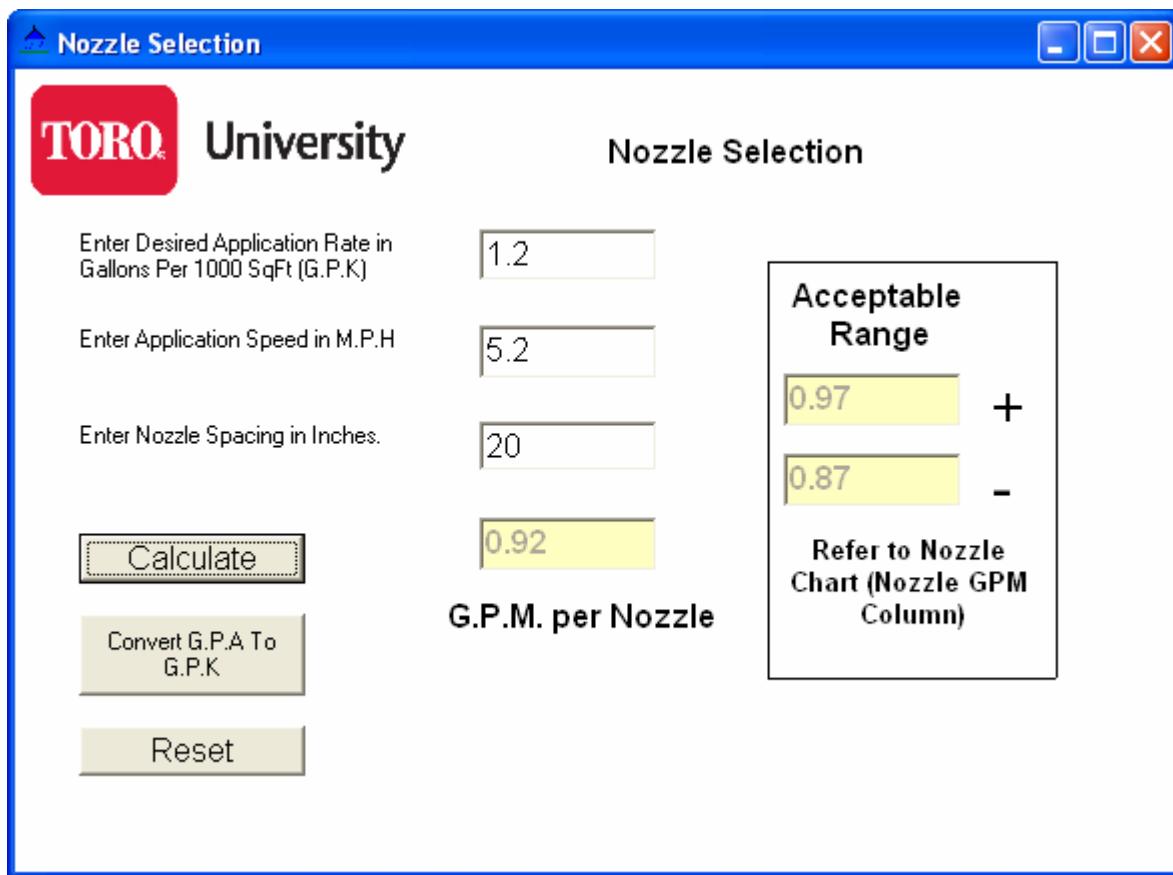
Multiple Tank Mixing

In the event that the amount of water needed to cover the desired area is greater then the capacity of the sprayer, multiple tanks are needed. The program will calculate the proper mixing rate for multiple tanks.

1. Multiple Tank Mixing
   a. The program will enter the total water required for the area to be sprayed from the previous screen.
      i. Enter the capacity of your sprayer tank.
         1. The program will return the total water per tank.
         2. The ounces per gallon of product required.
         3. The amount of product required for each tank.
      ii. The first column is for complete tanks
         1. "Example Tank 1 to 2"
      iii. The second column is for the last partial tank.
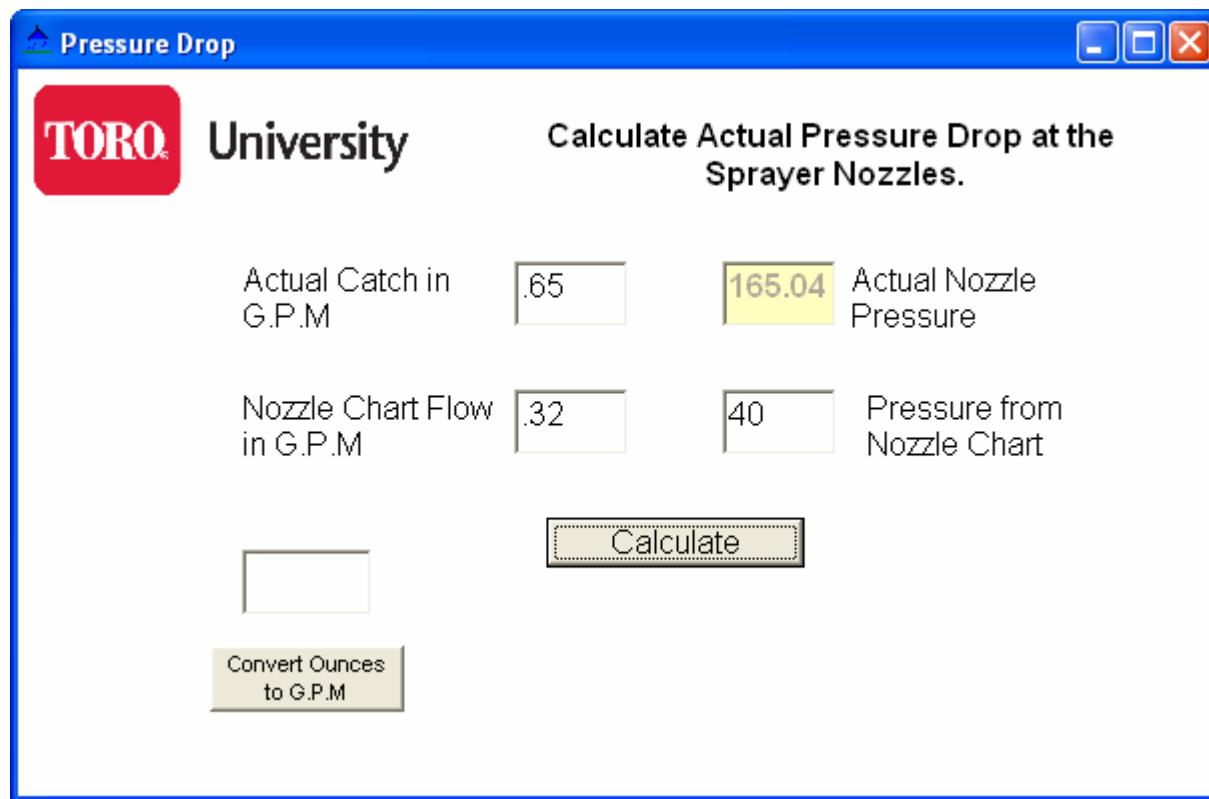
Nozzle Selection

To achieve the proper application rate from the sprayer the proper nozzle for the desired application rate needs to be selected.

1. Nozzle Selection Screen.
   a. Enter the desired Application rate in G.P.K
      i. If needed press Convert G.P.A. to G.P.K. to convert Gallons per Acre to Gallons per 1000 square ft.
      ii. The program will enter the converted value in the appropriate field.
   b. Enter the Application speed in M.P.H.
   c. Enter Nozzle spacing in Inches.
      i. The program will return the G.P.M per nozzle output that is required to achieve the desired application rate and the speed and nozzle spacing that was entered.
      ii. It will also display the acceptable maximum and minimum output of the nozzles.
      iii. Use this information to select the proper nozzle.
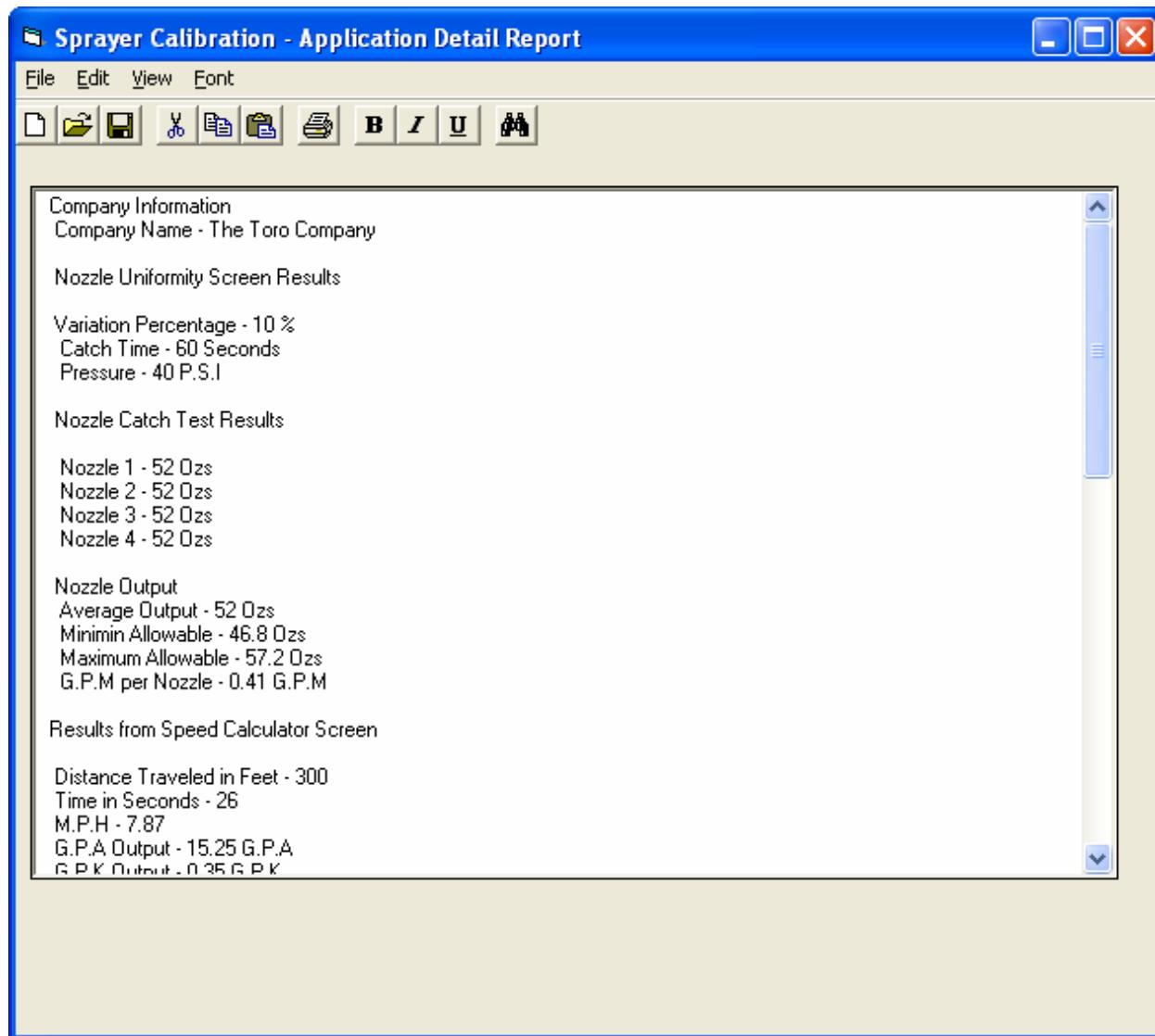
Nozzle Pressure Drop

When a situation is encountered where the proper application rate can not be achieved, this can indicate a problem with the sprayer. An area to check is the actual pressure at the nozzle. Pressure Drop Screen

    a. To troubleshoot an application rate problem we can calculate the actual pressure at the nozzle.

    b. Enter the actual G.P.M from a catch test.

    c. Enter the Nozzle Chart flow in G.P.M.

    d. Enter the Pressure from the Nozzle Chart.

    e. Press calculate.

        i. The program will return the actual pressure at the nozzle that it takes to product the output that you got in the catch test.

Print Report

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Sprayer Calibration - Application Detail Report          _ □ ✕

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│ Company Information                                      │
│  Company Name - The Toro Company                        │
│                                                         │
│ Nozzle Uniformity Screen Results                        │ ▓
│                                                         │
│ Variation Percentage - 10 %                             │
│  Catch Time - 60 Seconds                                │
│  Pressure - 40 P.S.I                                    │
│                                                         │
│ Nozzle Catch Test Results                               │
│                                                         │
│  Nozzle 1 - 52 Ozs                                      │
│  Nozzle 2 - 52 Ozs                                      │
│  Nozzle 3 - 52 Ozs                                      │
│  Nozzle 4 - 52 Ozs                                      │
│                                                         │
│ Nozzle Output                                           │
│  Average Output - 52 Ozs                                │
│  Minimin Allowable - 46.8 Ozs                           │
│  Maximum Allowable - 57.2 Ozs                           │
│  G.P.M per Nozzle - 0.41 G.P.M                          │
│                                                         │
│ Results from Speed Calculator Screen                    │
│                                                         │
│  Distance Traveled in Feet - 300                        │
│  Time in Seconds - 26                                   │
│  M.P.H - 7.87                                           │
│  G.P.A Output - 15.25 G.P.A                             │ ▼
│  G.P.K Output - 0.35 G.P.K                              │
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This screen will display the information collected from all of the calculation screens. This is useful for documenting the application rate, amount of chemical used, company name, date and applicator. It will collect all of the information used to perform the calculations.

The file can then be saved for further reference. If a printed copy is desired, the saved text file can be opened with Notepad, Wordpad or MS Word and printed from there.

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