

SUGGESTED EQUIPMENT AND SUPPLIES

- Topcon X20 Unit
- X20 User Manual
- Spreader manufacturer operator's manual
- Laptop with MS Excel or a notepad
- Bulk density measuring device
- Large catch pan or tub
- Cardboard or thick poster board
- Large set of scales
- Scoops
- Brooms

X20 AND SPREADER SETUP

- Load the hopper of the spreader with a sufficient amount of material to perform the calibration tests (at least half full).
- Using the bulk density measuring device, measure a sample of the material and document the value measured as you will need this later in the setup of the X20.
- Place scales on the ground under the discs so that the tub can sit on them while catching the material.
- Place tub on top of scales and record its empty weight.
- Using the cardboard or poster board, prepare a slide so that the material falls from the edge of the conveyor and is delivered to the large tub beneath the discs.
- Turn on the X20. The software should automatically boot up but if it doesn't, select the "Lynx1" icon on the desktop as shown in Figure 1.

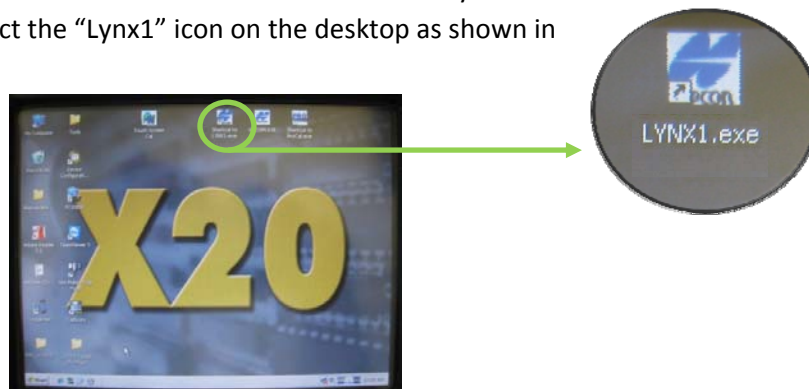


Figure 1. X20 Desktop Screen

- The next screen should be the "X20 Product Selection" screen as shown in Figure 2. Ensure that the "Spreader Controller" icon is selected. If not, select <STOP> at the bottom of the screen then select them. Once selected, press the <START> icon.



Figure 2. Product Selection Screen

- The working screen for the spreader control program should appear as shown in Figure 3.



Figure 3. Main Screen for Spreader Control Program

- Run some of the material off of the conveyor chain to ensure everything is working properly and to fill the chain with material as shown in Figure 4.

CAUTION: MAKE SURE ALL PERSONS PRESENT ARE STANDING CLEAR OF THE REAR OF THE SPREADER IN CASE THE SPINNER DISCS ENGAGE!!!



Figure 4. Illustration of the conveyor being full of material and the fabricated chute for directing material into the catch pan.

- **BEFORE** engaging the PTO, select <Master Switch Icon> at the bottom of the working screen so that it turns green. Touch the discs on the screen so that they are no longer highlighted (will turn gray) and the conveyor on the screen is the only item highlighted (yellow).
 - Engage the PTO while the tractor RPMs are low. Ensure that the discs are **NOT** spinning and that the conveyor is moving.
 - Turn the conveyor off by touching the conveyor on the X20 screen.
- Empty the catch pan or tub and tear the weight.
- Complete X20 setup.

NOTE: If this is the initial setup of the X20, read the user manual for appropriate settings and selecting the correct type of hydraulic control valve.

- From the Main Spreader Screen, select <Options>, <Granular Tab>, <Settings>
- Insert *gate width*, *gate height*, and *compensation factor*.
 - Gate height should be determined from the manufacturer’s recommendations for desired application rate(s). If more than one application rate is desired for the same material, use a median rate for calibration.
 - Set the “compensation factor” equal to 1 before beginning the calibration.
 - Select <OK>.
- Select <Products Tab>.
 - Highlight the desired material.
 - If desired material is not listed, select <Change Product List>, name the material, select <Change Density>, and enter the measured bulk density in the appropriate units. Select <Save to List>, <Yes>, <Close>.
 - Select <Close>.
- From the working screen, select <Tank/Bin> icon in the top left-hand corner.
 - In the menu on the right-hand side of the screen, enter the desired application rate by selecting the <Calculator Icon>.
 - For product, select the <Calculator Icon> to choose the desired material.
 - ❖ If the Reference Density is different from what was measured, select <Adjust Density> and enter the correct density.
 - ❖ Select the desired swath width by selecting the <Calculator Icon> under Spreading Width.
 - ❖ Select <Accept Calculated Cal. Factor>. Document this value in an Excel spreadsheet or on a note pad.
- The X20 is now setup for calibration. Archive the setup parameters for future reference.

CALIBRATION PROCEDURES

- 1) Select the <Tank/Bin1> icon in the top left hand corner of the X20 screen then <Cal.1> in the menu on the right side of the screen.
- 2) After engaging the PTO to the appropriate working RPMs for your tractor, select <On/Off> next to Valve. Material will begin to fall from the conveyor as shown in Figure 5.



Figure 5. Material flowing from conveyor, onto slide, and into a collection device (e.g. tub).

- 3) Once a sufficient amount of material is in the tub, select <On/Off> to stop the conveyance of material.
- 4) Record the weight displayed under <Check>.
- 5) After making sure that all material from the edge of the conveyor and on the slide is in the tub, remove the filled tub from the scales.
- 6) Weigh the material in the tub.
 - i. Zero the scales then lower the filled tub to weigh the material.
 - ii. Subtract the tub's empty weight from the total weight and record this weight in the Excel spreadsheet or on paper.
- 7) Within the Excel spreadsheet or with calculator, calculate the percent difference between the "Check Weight" and the "Actual Weight" using the following equation:

$$\% \text{ Difference} = \left[\frac{(\text{Check Weight} - \text{Actual Weight})}{\text{Check Weight}} \right] \times 100$$

- 8) Enter the actual weight of the material back into the X20 by selecting <Enter Weight>. A new window will appear with a new calibration factor. Document this cal. factor within the Excel spreadsheet or on paper and select <Accept>.
- 9) Repeat steps 1-8 until the calculated percent difference is acceptable (typically less than 5%).
- 10) It is recommended that you perform steps 1-8 until two consecutive tests are less than 5% different.
- 11) Select <Done> to complete the calibration process.