Brixmaster

1. General

When grapes are harvested, especially table grapes, it is essential that the grapes be harvested at the right sugar concentration or content. When grapes are harvest for the export market, it is even more important to harvest the grapes at the right ripeness because grapes with too low sugar content will be rejected.

Refractometers are used to determine the sugar level in fruit. This instrument uses a prism to determine the amount of sugar in the grape. Although this is a very accurate instrument, it is too expensive and delicate to issue each picker or harvester with one. The result is that pickers rely on tasting the grape berry to determine the sugar content. This is a very inaccurate and uncomfortable method.

What table grape producers needed was a, relatively accurate, low cost and easy to use device with a fast reading to be able them to issue one to each of their laborers, independent of their level of skills.

With the arrival of the patented Brixmaster, this need was fulfilled.

The Brixmaster is a mechanical device, using the specific gravity to determine the sugar contents of the grapes. The higher the sugar level, the higher the specific gravity of the grape, and visa versa.

The Brixmaster will not give a direct reading, but will, within seconds, indicate if the grape is above or below the sugar level tested for.

How this is done:

- A calibration solution is made up for the sugar level to be tested for. (Method described under "Information"
- The Brixmaster is now filled with this solution.
- The pickers can now secure the *Brixmaster* to their waists by using the included belt clips. To test a grape berry, the picker will put the grape into the Brixmaster with the solution.
- If it floats, the sugar content is too low and the bunch cannot be picked, and
- If it sinks, the sugar content is right and the bunch can be picked.
- The grape under test can be removed by taking the strainer out of the solution using the finger holes and empting it before replacing it again.
- If the solution-level in the *Brixmaster* drops too low, top it up with new solution.

The advantages of the Brixmaster:

- Simple to use so that unskilled labor will be able to use it.
- Low cost so that each picker can be issued with one.
- Results within seconds
- Made from high impact resistant material.

The cost of the Brixmaster is less than a tenth of the cost of a refractometer and the cost of the medium will be minimal.

2. Information:

2.1 Contents inside packaging

In the *Brixmaster* packaging you will find the following:

- The *Brixmaster* consisting of:
    - The outside cup
    - The threaded lid
    - The inside strainer
- The operating instructions
- A belt clip
- A measuring tumbler

To use the Brixmaster, the first step is to determine the concentration of the solution needed to test for a certain sugar level. To do this, follow the steps under "How to prepare the calibration medium".

Please note that once the concentration is determined, this data can be used over and over, so this calibration process needs only to be done once for a specific sugar contents for each variety.

2.2 How to prepare the calibration medium

To do the calibration one needs the following:

- The *Brixmaster*
- Calibration medium (Powder)
- A one liter container
- The measuring tumbler or a scale with an accuracy of at least one gram.

Method: (In this method we assume a calibration solution to test for 16 Brix)

1. With the aid of a refractometer find a grape bunch within the required sugar level. (In our example, if the grapes is meant to be harvest at 16 Brix, find a bunch in that range)
2. Pick from the bunch several grape berries – say two from the top of the bunch, two from the bottom of the bunch, and two from the middle of the bunch. If your choice in "1" was right, you will now have berries with sugar contents round about 16 Brix.
3. Put exactly one liter of water into the container.
4. Using the measuring tumbler or the scale, start by adding 60 gram of medium into the water and stir until dissolved.
5. Put all the grape berries (Point 2) into the solution – it will sink.
6. Take the berries out and add a small quantity of medium into the solution, (about 5 grams) while stirring thoroughly.
7. Put the grapes back into the solution – if it sinks again repeat from point 6.
8. While doing this, keep track of the total medium added to the liter of water.
9. ***The aim is to determine the point where a berry or berries is just starting to float. This point is reached when, if the grape is put into the solution, it will sink initially and then start to rise to the surface of the solution slowly.***
10. If point 9 is true, and a berry rise to the surface, take a reading of the sugar content with a refractometer. The berry with the least sugar content will rise first – in our example you may find that the berry will be for example 15.2 Brix. This now means that you have reach a calibration point where grapes of sugar level 15.2 Brix will float and any grapes with sugar content higher of 15.2 will sink.

11. If this is not the sugar level you want to test for (like in our example), add more medium (described in point 6) until more berries start floating. (as described in point 9)
12. Each time a berry float the sugar level must be tested until you reach the concentration representing the sugar level you want to test the grapes for.
13. You have reached the correct calibration concentration now.
14. Note the quantity of medium used in the liter of water.
15. Bigger quantities of solution can now be mixed by using the data gathered in point 14. For example, if five-liter solution is needed, use five times the quantity medium as noted in point 14.
16. It may be advisable to test the larger volume of solution with berries to ensure that the concentration is right.
17. If, per accident, too much medium is added, solute with water to get back to the required concentration.

18. The Brixmaster cups can now be filled to a level of about 10mm from the top.
19. The pickers can now secure the *Brixmaster* to their waists by using the belt clips.
20. To test a grape, the picker will put it into the Brixmaster. **If it floats, the sugar content is too low (Lower than calibrated for) and the bunch must not be picked, and if it sinks, the sugar content is right (Sugar content higher than calibrated for) and the bunch can be picked.**
21. The grape under test can be removed by taking the strainer out of the solution using the finger holes. The strainer can now be emptied before replacing it again.
22. If the solution-level in the *Brixmaster* drops too low, top it up with new solution.

2.3 Important points:

- Use water from the same source to mix the initial calibration solution and the larger quantity solutions.
- Shake or stir the solution if it was standing for some time.
- Different varieties of grapes with the same sugar contents will require different concentration solutions. Determine for each variety its own concentration.
- The attached graph can be used as an indication to simplify the calibration process. This graph shows Medium mixing quantities per liter water for different varieties of grapes. Please note that this is only an indication and may vary from area to area and season to season.
- Please rinse the Brixmaster every evening to prevent incorrect readings.
- The medium is not harmful to human or plants.
- If the water used throughout the season stays the same, one should only have to determine the solution concentration once per season.
- Please note that because of thermodynamic properties, the densities of liquids, including water, will vary with variations in temperature. Although the effect this will have on the Brixmaster Medium solution will be minimal, the user should try to keep the temperature of the solution as stable as possible. In practice this will mean that the solution should not be left in the direct sun, or should not be cooled down.
- Mixed Medium can be re-used as long as accuracy is ensured by regular testing.
- When the correct solution concentration is reached, a refractometer reading of the solution can be taken with for later reference to speed up further mixings.
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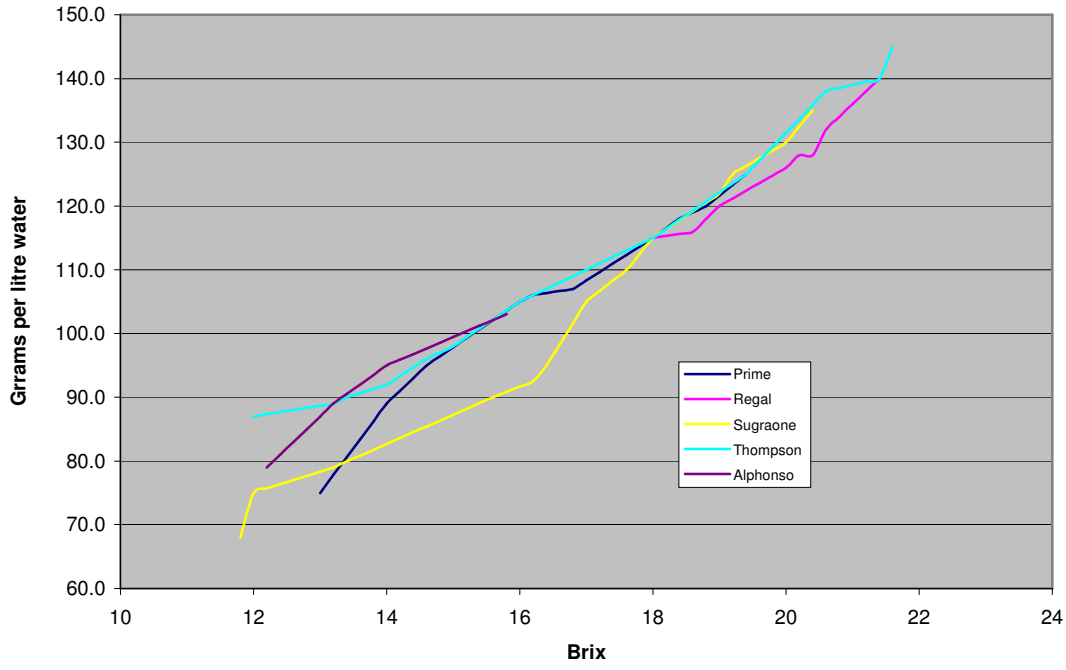
Graph to assist in initial Calibration



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