What is calibration:

Calibration is a **lot more** than applying a specific amount per hectare.
Calibration is:

1. **A specific amount per hectare or per tree**. In the Lowveld we have tree spacings from 6m to 12m. In this case, we look at calibrating per tree, as an application rate per hectare will result in the smaller spacing trees getting less applied chemical.
2. **Nozzle selection:** Young trees are further apart inter row, therefore needing different nozzles to achieve the distance than older trees that are closer together inter row. Here one would use full cones with a narrower spray angle for younger trees. As trees mature, so this will change.
   Foliage density also plays an important role in **nozzle selection.** Very thick foliage requires more full cones with small spray angles than hollow cones. **As long as spray patterns overlap before canopy.**
   Tree height also plays an important roll. Again, a full cone with a narrower spray angle will travel further. There are also alternative nozzles that can be used to achieve height.
   Dominant pest problem in the orchard. This also affects the nozzle selection. In the past, stink bug was the main problem, hence a lot more water to the top of the tree. (60% in the top 30% of the tree) With other bugs becoming problematic, more water is still applied to the tops, but not in the same quantities.
   Fan Wind Speed. This plays an important roll in nozzle selection as well. Fine droplets travel slower than coarser droplets, hence slower wind speeds will not be as effective as higher wind speeds with finer droplets. An example of this is the Albuz ATR 80˚nozzle. This nozzle, with the correct wind speed, can be very effective. Slower wind speeds work better with larger droplets. Droplets are “pushed” into the tree, whereas a faster wind speed will “suck” the droplets into the tree and improve coverage and penetration by this action.

44 Percy Fitzpatrick Drive - Nelspruit – Cell: 083 248 3880
arthur@lowveldsprayers.com – www.lowveldsprayers.com

3. **Pressure:** Pressure alone does not give penetration and height. **Pressure** has an effect on droplet size. Higher pressure – smaller droplet size.

4. **PTO speed:** also plays a very important roll in calibration. A 540 RPM PTO speed gives the correct fan speed, very important for penetration height etc. Do not trust your Rev counter. A worn clutch on your PTO can result in reduced PTO speed.

Worn Nozzles. Worn nozzles have two major effects. A worn nozzle applies more chemical. Increased cost. A worn nozzle has an affected spray pattern. Reduced efficacy.

Pressure gauge wear. The spring (Bourdon spring) in a pressure gauge wears as well. This will lead to inaccuracy on application which also affects droplet size and spray pattern. Test pressure gauge regularly.

Replace when worn.

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Tractor speed plays a huge roll in calibration and efficacy of sprayer. The higher your tractor speed the worse penetration and coverage becomes. Unless you have a sprayer that is designed for higher speeds, rather slow down and do it properly.

DO NOT SPRAY TO FINISH. SPRAY UNTIL YOU ARE FINISHED.

KNOW YOUR SPRAYER. Find out what its wind speed and wind volume is. This will enable you to fit the correct nozzles applied at the right speed with the greatest efficacy.

Wind direction: Make sure that your nozzle is spraying in the same direction as the wind / Air flow.

When should one calibrate? My recommendation is to calibrate when your trees are at their best. It is easy to get penetration after a good pruning. Calibration before harvest is the best time to identify penetration and coverage.

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