

## IT DOESN'T WORK WITHOUT NOZZLE CLEANING



### Recommendations and practical experience

Externally, the nozzles appear to be clean and in proper condition. If you take a closer look, however, deposits or dirt form or settle in the mouthpiece, which affect the spray pattern and the lateral distribution. The problem is noticed by an insufficient lateral distribution at the latest during the device test.

#### Why do deposits form in the nozzles?

The reasons can be quite different. Often tank mixtures with (too) many components and also micronutrient fertilizers lead to the complex formation, flocculation and finally also to deposits of the spray liquid in the sprayer and the nozzles. This is favoured by hard or very hard water with a total hardness of more than 14° dH. Own well water can be extremely hard in exceptional cases with 40 or 50°dH. It is important if you use your own water or rainwater, to ensure sedimentation of particles / fine sand or to filter them out before filling the sprayer.

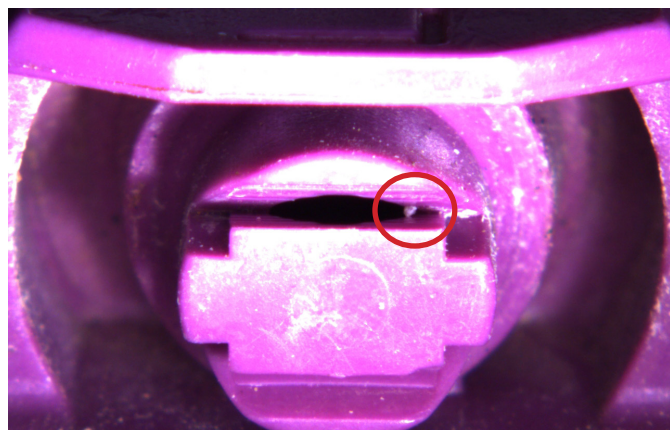
Even when spraying in the same crop for longer periods of time, especially under the circumstances described above, the spray pipe and nozzles should be flushed with fresh water, as under warm, dry conditions deposits can quickly form in the sprayer and nozzles.

The rinsing and cleaning of the sprayer after completion of the spraying work is actually a matter of routine. Continuous internal cleaning with a second, small clear water pump and suitable tank cleaning nozzles, e.g. the Lechler ContiCleaners, is an ideal system to clean the sprayer quickly and easily.

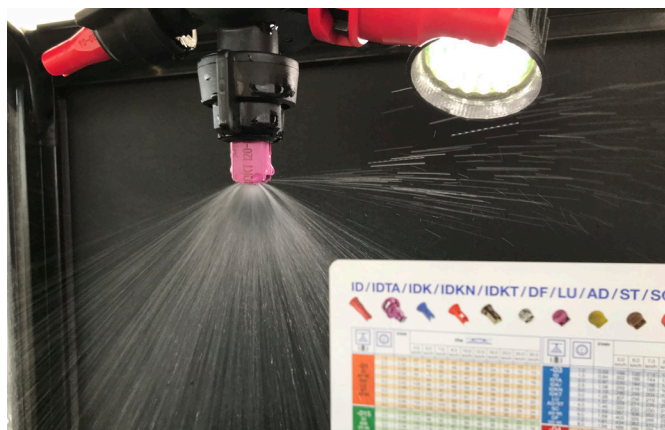
Professionals who apply these rules and routines report very few or no problems with contaminated or clogged nozzles.

According to our experience, deposits can form in all nozzle types although double flat fan nozzles can sometimes be more sensitive. The mouthpieces are finer and the surface around which the spray liquid flows is larger.

Important: With an injector double flat fan nozzle such as the IDKT, the flow rate is always measured through the inlet hole at the injector of the nozzle, not by the size of the mouthpiece. The two mouthpieces e.g. of an IDKT 120-04 have approximately the dimension of a single-jet 025 nozzle. A „normal“ 04 nozzle such as the IDK 120-04 is therefore less sensitive to deposits than a double flat fan nozzle in 04 size.



Particles in the mouthpiece of an IDKT 025 lead to poor lateral distribution



## IT DOESN'T WORK WITHOUT NOZZLE CLEANING – Recommendations and practical experience

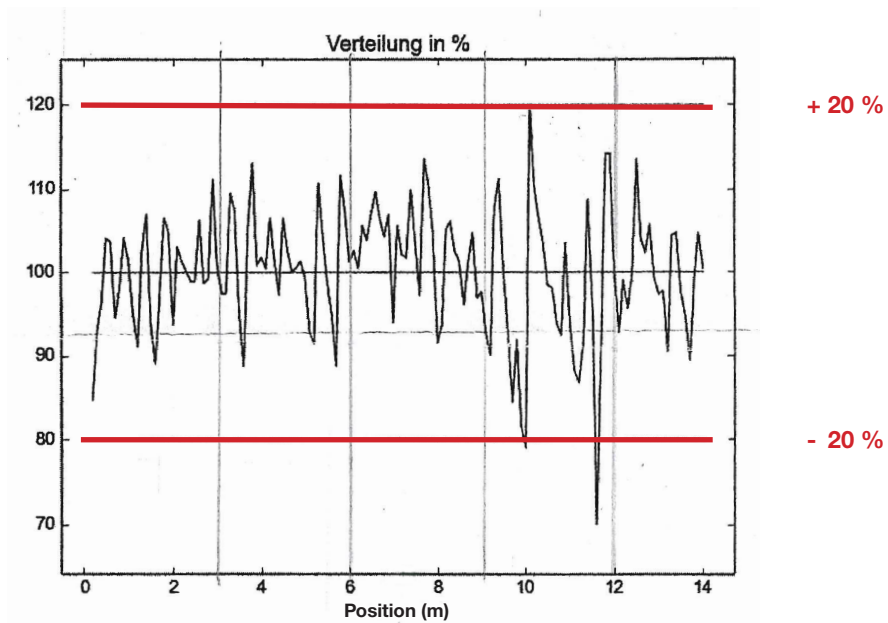


Figure 1: Lateral distribution of **used** IDKT 120-025 nozzles at the sprayer check

Figure 1 shows the result of a measurement of the lateral distribution in the sprayer check with a coefficient of variation (VK) of 7.55% - max. 10% is permitted. However, the deviation of individual quantities of up to 29.94% is too high. According to new guidelines since 2015, +/- 20% have been permitted here. These few outliers at a proper VK indicate problems at certain boom points. The cause can be dirty nozzles, clogged filters, an incorrect orientation of the nozzles (jets meet) or the spraying of equipment parts.

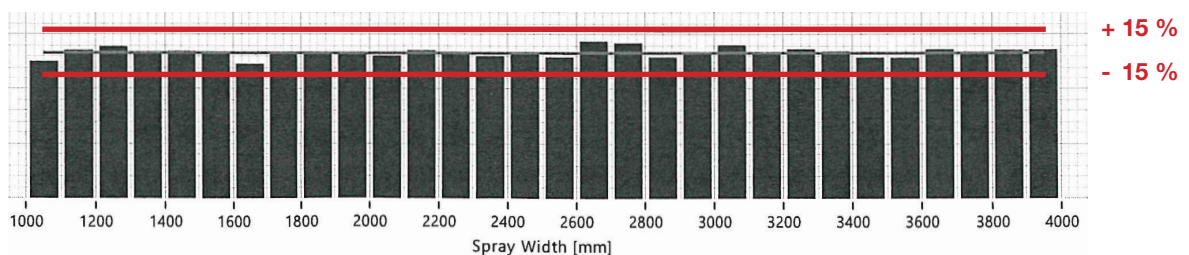


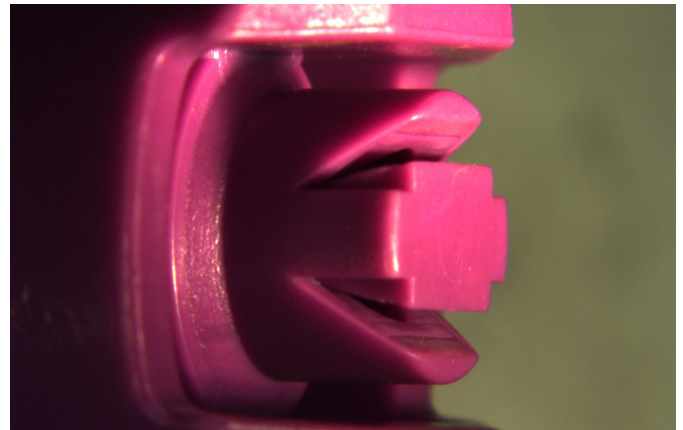
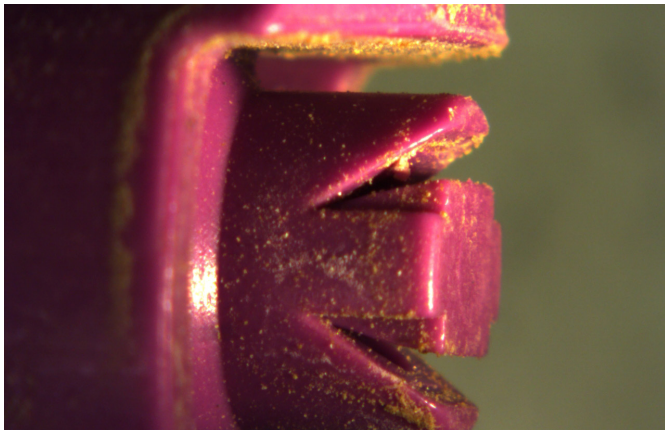
Figure 2: Lateral distribution on the Lechler test bench with the same IDKT 120-025 as in Figure 1 **after cleaning** in an ultrasonic bath. Please note the deviating representation with the tolerance range of +/- 15% according to the Lechler factory standard.

The uniformity of the lateral distribution with a VK of now 3.4% (before cleaning 7.55%) improves. The maximum deviation of the individual values is now 7.9%, before cleaning it was up to 29.94%. These nozzles can easily pass the sprayer check after cleaning.

## IT DOESN'T WORK WITHOUT NOZZLE CLEANING — Recommendations and practical experience

### Which steps ensure a permanently good spray pattern?

- Flush the boom and the nozzles with clear water at longer intervals – in any case at the end of the day and before longer breaks.
- For known critical pesticides/micronutrients after each tank filling, briefly clean the boom with clear water.
- Pay attention to the correct filtering - see filter recommendation in the spray tables
- Operate agitator intensively. Dissolve product well, if necessary pre-dissolve in warm water, filling sequence depends on the formulation of the product (WG, SC, EC, ...).
- Cleaning with a nozzle brush often helps to remove deposits like small grains, sand etc. in the mouthpiece.
- Blow particles with compressed air against the direction of spraying, with injector nozzles it is better to remove the injector first.
- Remove the nozzles at least once a year at the end of the spray season, put them into warm water with sprayer cleaner and clean them with a brush and compressed air. If you have a lot to spray, do it also once during the season.
- An ultrasonic bath is suitable to remove stubborn deposits in the nozzle. Therefore use warm water and a little dish liquid or sprayer cleaner and disassemble the nozzles as far as possible.
- Replace the nozzles when the wear limit is reached (measure the flow rate) or if the deposits cannot be cleaned anymore



An apparently „clean“ nozzle before and after cleaning in an ultrasonic bath

### Which methods are less suitable for removing deposits from nozzles?

- Conventional cleaning agents for sprayers hardly clean any deposits that have already settled - soaking and mechanical after-cleaning or an ultrasonic bath are necessary
- When the nozzle is mounted, cleaning brushes or high-pressure cleaner, cannot remove deposits from the interior of a nozzle can
- Sharp objects such as a wire, nail, screwdriver, knives etc. usually damage the mouthpiece
- For reasons of hygiene and food safety do not clean nozzles in the dish washer or washing machine. There is also a risk of mechanical damage of the nozzles.

Modern plant protection involves more than just the use of environmentally friendly chemicals. It is above all a question of precision. Lechler agricultural nozzles are good for your crop and for the environment.

