A MODIFIED SPRAY NOZZLE FOR AGRICULTURAL SPRAY APPLICATION RESEARCH

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In spray application research it is often necessary to change spray nozzle tips in the field or laboratory or to remove tips for cleaning. The necessity for a wrench to remove or install tips, combined with periodic failures of nozzle caps during tightening by field personnel to stop leaks, led the author to think that there might be an easier way to secure spray tips to nozzle bodies. This note describes a modified spray nozzle body design that facilitates the removal and installation of spray tips on experimental agricultural sprayers.

The primary cause of difficulty, or perhaps inconvenience, in removing or installing spray tips in a conventional nozzle installation is the high bearing load required to seal the metal tip against the metal nozzle body, particularly if the sealing surface of the body is imperfect. An easy solution is to substitute a resilient seat for the brass surface in a normal body. In the design developed by the author the seat consists of a rubber O-ring installed in an annular groove in the face of the modified nozzle body. Figure 1 shows an exploded view of the modified nozzle assembly.

The necessity for another change became apparent shortly after the modified nozzle body came into use. This additional change involved removal of the wrench flats from the nozzle caps. It quickly became obvious that when wrench flats were provided, people used a wrench or other available tool to tighten the cap nuts, thereby defeating the purpose of the exercise, which was to make the caps easily removable by hand. The removal of the flats eliminated this problem.

Experience has shown that installing the caps finger tight will ensure sealing at pressures up to about 700 kPa, well in excess of the pressures encountered in normal spraying operations. While the tip-to-body seal is leak proof, it is still sufficiently loose to allow ready alignment of the tip with the boom after installation. This avoids the need for two wrenches when installing tips, one to tighten the cap nut and the other to hold the tip in the correct position.

To prevent dribbling when the sprayer is shut off, a ball check valve was incorporated into the nozzle body. There was no provision in the modified nozzle for a tip strainer; however, for a research sprayer with a line strainer this is not a problem.

The modified nozzles described above have proved useful during several years of use on a laboratory sprayer. The lack of a nozzle strainer has not created any problem to date, although it could limit the

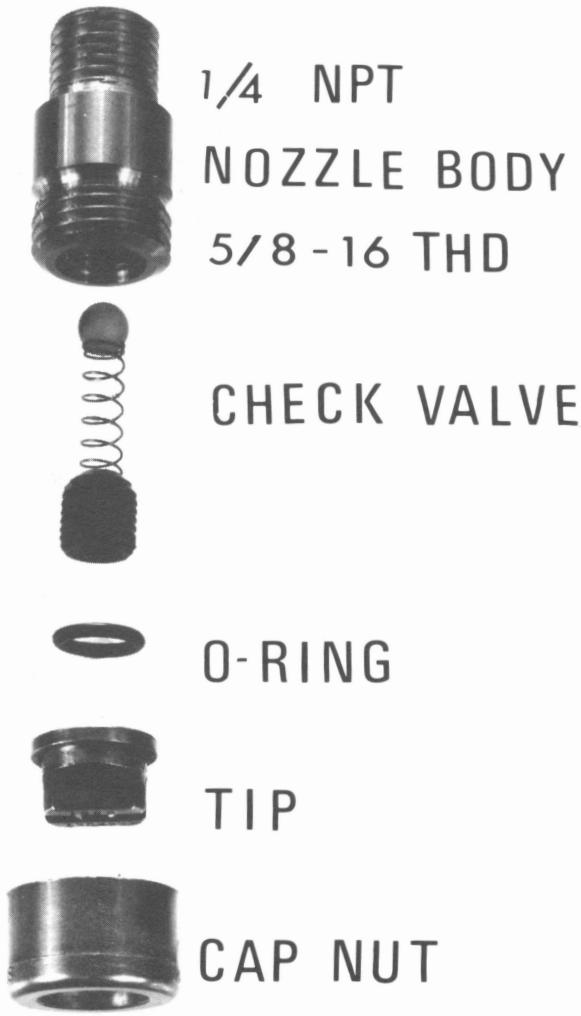

Figure 1. Exploded view of the modified nozzle body.

serviceability of the sprayer in normal farm use, where there is increased likelihood of contamination by particulate matter that could cause plugging. The ease with which spray tips can be removed and installed should make the modified nozzle body useful to those involved in sprayer research.

In recent years some commercial suppliers have produced nozzle bodies with quickly removable caps which greatly facilitate tip changes in the field. These bodies are generally made of plastic and frequently incorporate some means for automatically aligning the spray tip. While these nozzles should be a boon to the operator, they lack the flexibility and chemical resistance which may be required by the research worker.