

IR-4 Advisory #2004-01 (August 10, 2004)

Title: Foliar Broadcast Spray Swath vs Plot Width

Issue/

Question: In some trials, broadcast spray swaths (number of nozzles \times nozzle spacing) used to calculate foliar application rates are insufficient to provide complete coverage of outside rows in plots for which plot width is defined as number of rows \times row spacing in Part 5 of the FDB.

Background: Concerns have arisen (QA/RFC/SD reviews of FDB) regarding possible insufficient coverage of all plot rows during test substance applications, on crops such as dry beans, snap beans, tomato, pepper, and cantaloupe. In every case the FRD used a broadcast boom to make foliar applications, with calculations correctly based on number of nozzles \times nozzle spacing (assuming that nozzle type, spacing and height above target are accurate, per nozzle manufacturer guidance). However, in Part 5 of the FDB, the FRD defined treated plot widths based on number of rows \times row spacing, and actual spray swaths were not as wide as the designated treated plot widths.

The following examples from FDBs demonstrate the issue: ① In one case with 4 tomato rows at a 40-in. spacing (plot width recorded as 160 in. in Part 5), spray swath was 140 in. (7 nozzles \times 20 in. spacing). ② In another case with 3 rows of snap beans at a 30-in. spacing (plot width recorded as 7.5 ft. in Part 5), spray swath was 6 ft.

Discussion: When plots are staked out and/or planted, plot area based on number of rows \times row spacing may differ from the area that will be treated later with a broadcast boom. In the examples above, actual treated area did differ from the plot area recorded in Part 5. The 2004 FDB has a prompt in Part 6A for a brief explanation if treated area does not equal plot area, to assist reviewers in understanding that plot dimensions in Part 5 differed from actual treated area.

Also in the examples above, complete spray coverage of the outside plot rows may not have been achieved. In example ①, outside rows were avoided during sampling (2 middle rows were sampled), so residue samples collected were clearly from plants that received complete coverage of the protocol-required rate of test substance. But, in example ②, since residue samples included beans from all three rows, it is not so certain that samples collected were from plants that received complete coverage of the protocol-required rate of test substance.

Recommendations

For FRDs:

- 1) Be certain that your broadcast boom is setup per nozzle manufacturer guidance (nozzle type, spacing, height from target) to give an accurate spray swath based on number of nozzles \times nozzle spacing.
- 2) Clearly indicate in Part 6A of the FDB if the treated area is different from the plot size depicted in the plot map in Part 5, and that calculations are based on swath width of the boom (not rows \times row spacing) for foliar broadcast applications.
- 3) Collect samples only from interior/non-border rows that received complete spray coverage (bordered, if possible, by rows that also received complete spray coverage) equivalent to the per acre rate specified in the protocol. Be sure to clearly state this in the harvest description in Part 7A of the FDB.

If you have any questions, please contact your Regional/ARS Field Coordinator or the appropriate Study Director for further guidance.