

AN OUTLINE OF ISSUES IN THE DESIGN AND
ANALYSIS OF WEED CONTROL EXPERIMENTS

I. Site Selection

- Need to select sites with representative weeds. This may imply site selection in previous cycle to see weeds in field.
- Need to make sure that other characteristics of plot are representative of the recommendation domain, especially those characteristics that interact with weeds (rotation history, previous weed control, land preparation).

II. Plot Size, Treatment Number

- Because of the variability in weeds in any field, and the difficulty of actually representing farmers practices in small plots, plot size should be as large as possible.
- Because the idea is to work towards simple recommendations that farmers can use, the number of treatments should generally be small.
- Research to find the "best-bet" herbicide treatment, when farmers use manual weed control, may at times be done without including the farmers treatment. The idea is to move as quickly as possible to trials with large plots that include farmer's treatment.
- Because it is difficult to simulate a farmer's weed control practice on a small plot it is sometimes best to estimate yield from farmers practice by taking a crop cut from his field.
- Researchers want to be careful to not set up a situation where they have an experiment which encourages competition with the

farmer - "your method" vs. "ours". This requires good communication with the farmer.

- Random designs are often difficult for weed control trials. Strip plot designs may be preferable.

III. Treatments

- It may be best to define timing of treatments in terms of the state of the weeds rather than number of days after planting. Weed growth varies according to rainfall and other factors, and farmers generally make weeding decisions on the basis of the state of the weeds rather than time elapsed since planting.
- Some flexibility is required, because weed growth often presents surprises. In some cases it may be best to state treatments in terms of simple decision rules, e.g. "If there are many grassy weed apply product X, otherwise apply product Y". These rules may be incorporated into recommendations.
- The use of decision rules helps avoid the problem of changing treatments, or touching them up, during the cycle, which makes the job of analysis very difficult.
- Farmers practice in trial should be an average of farmers normal practice i.e. if he takes 12 days to hoe his own field, his treatment should be hoed on 6th day. This is often difficult to do in practice, and argues for larger plots under farmers control, or crop cutting.

IV Observations During Cycle

- It is usually not advisable to have a "no control" treatment. Farmers don't like this, and often weed it themselves. Alternative ways of taking weed observations should be devised.

V Analysis

- The experiments themselves cannot be relied upon to give data on the labor required for farmer's practice. This must come from interviews with a sample of representative farmers.
- Similarly, if a new weed control technique is being proposed which requires different labor usage, then investigators will have to talk with farmers and make observations regarding labor time for the new practice.
- Investigators must also obtain data on all other costs associated with the various weed control treatments under investigation, including water, renting sprayer, etc.

REFERENCES:

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