BEHAVIORAL INSIGHT BRIEF

Test, Learn, Adapt

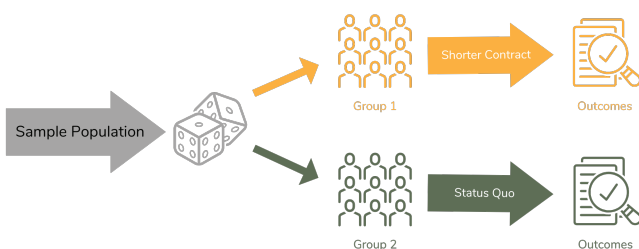Innovate by running experiments in your programs.

Background

In business, health, public policy, and nearly every other field, people want to know how actions impact outcomes. Do farmers obtain higher yields using fertilizer A or fertilizer B? Do patients live longer taking pill A or pill B? How much more money do workers earn if they study high school curriculum A relative to curriculum B?

We are often tempted to learn about the causal effect of A relative to B by observing outcomes that occur naturally. That's a great starting point for forming hypotheses, but it can sometimes be misleading. For example, say we observe that Iowa farmers use fertilizer A and Vermont farmers use fertilizer B. Observations of higher yields in Iowa do not necessarily imply that fertilizer A is superior to B. The yield differences may be partially or entirely due to differences in the farmers or farms in the two states. How can we isolate the causal effect on yield from adopting fertilizer A, separate from all the other factors that affect yield?

The answer is well-known: run an experiment in which you randomly assign farm plots to fertilizer A or B. With a large enough sample of plots, groups that are randomly assigned to different fertilizers will be, on average, very similar with regard to other factors that affect yields. Thus we can be very confident that, if there is an observed difference in yields between A and B, the difference is caused by the change in fertilizer. Researchers call this type of experiment a randomized controlled trial (RCT).

RCTs are not just good for estimating the causal effects of agricultural inputs. They're a great way to learn about the impacts of different designs for agricultural programs, such as programs aimed at supplying microcredit, crop insurance, or agri-environmental technical assistance and incentives.

What Can Be Learned from This?

RCTs are often the most promising way to learn about human behavior in real-life contexts. Say, for example, we want to estimate how shortening the length of a cost-share contract would affect participation and the total amount of area enrolled in cost-shared practices. You could try three approaches:

1. Ask farmers in a survey. Potential Problem: The answers you receive from hypothetical questions might not be good indicators of what farmers would do in an actual program.

2. Compare outcomes across programs with different contract lengths. Potential Problem: Differences across programs might be caused by other differences in program features rather than the differences in contract length.

3. Change the contract length for everyone, and compare outcomes from one year to the next. Potential Problem: Differences from one year to the next might be caused by other changes in farming conditions over time, not the change in the contract length.

A more credible and more easily implemented approach is:

Select some farmers at random ("pick names from a hat") and offer them a pilot program opportunity that will shorten or extend the existing contract length (see Figure 1). The random assignment is the key piece of the puzzle. With random assignment, all you have to do to estimate the causal effects of changing the contract length is compare outcomes between the group in the pilot program and the group in the status quo program. Well-known statistical tests can tell you how likely an observed difference could be just a fluke of chance, rather than a real effect.

RCTs have been used by agricultural and medical researchers for over a century. More recently, economists and other social scientists, in collaboration with program managers, have been adopting this method to evaluate public programs.

Embedding an experimental design into one of your programs may sound daunting, but it is no harder than designing a high-quality survey, and considerably easier than trying to disentangle causal relationships from non-experimental data.

At CBEAR, we carefully design and implement RCTs to shed light on critical agri-environmental issues, build evidence, and shape future policy.