



# **Grow the Crop**

## **Handout 24**

### **Sampling**

# Information about sampling when doing a survey

## Sampling methods

From the food you eat to the television you watch, from political elections to school board actions, much of your life is regulated by the results of sample surveys.

A sample is a group of units selected from a larger group (the population). By studying the sample, one hopes to draw valid conclusions about the larger group. A sample is generally selected for study because the population is too large to study in its entirety. The sample should be representative of the general population. This is often best achieved by random sampling. Also, before collecting the sample, it is important that one carefully and completely defines the population, including a description of the members to be included. A common problem in business statistical decision-making arises when we need information about a collection called a population but find that the cost of obtaining the information is prohibitive. For instance, suppose we need to know the average shelf life of current inventory. If the inventory is large, the cost of checking records for each item might be high enough to cancel the benefit of having the information.

On the other hand, a hunch about the average shelf life might not be good enough for decision-making purposes. This means we must arrive at a compromise that involves selecting a small number of items and calculating an average shelf life as an estimate of the average shelf life of all items in inventory.

This is a compromise, since the measurements for a sample from the inventory will produce only an estimate of the value we want, but at substantial savings. What we would like to know is how "good" the estimate is and how much more will it cost to make it "better". Information of this type is intimately related to sampling techniques. This section provides a short discussion on the common methods of business statistical sampling.

## Cluster sampling

Cluster sampling can be used whenever the population is homogeneous but can be partitioned. In many applications the partitioning is a result of physical distance. For instance, in the insurance industry, there are small "clusters" of employees in field offices scattered about the country. In such a case, a random sampling of employee work habits might not require travel to many of the "clusters" or field offices in order to get the data. Totally sampling each one of a small number of clusters chosen at random can eliminate much of the cost associated with the data requirements of management.

## Random sampling

Random sampling is probably the most popular sampling method used in decision making today. Many decisions are made, for instance, by choosing a number out of a hat or a numbered bead from a barrel, and both of these methods are attempts to achieve a random choice from a set of items. But true random sampling must be achieved with the aid of a computer or a random number table whose values are generated by computer random number generators.

## Cross-Sectional Sampling

Cross-Sectional study the observation of a defined population at a single point in time or time interval. Exposure and outcome are determined simultaneously. What is a statistical instrument? A statistical instrument is any process that aim at describing a phenomenon by using any instrument or device, however the results may be used as a control tool. Examples of statistical instruments are questionnaire and surveys sampling.

## Grab sampling technique

The grab sampling technique is to take a relatively small sample over a very short period of time, the results obtained are usually instantaneous. However, the Passive Sampling is a technique where a sampling device is used for an extended time under similar conditions. Depending on the desirable statistical investigation, the passive sampling may be a useful alternative or even more appropriate than grab sampling. However, a passive sampling technique needs to be developed and tested in the field.