TOOLS T 10	Pest and natural enemy monitoring / Population sampling
	Theoretical

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WHAT IS…	Population sampling is the collective name for activities conducted to estimate the population density of a given species (an animal pest, a plant pathogen, a weed or a natural enemy) in a given habitat (the plot where the crop is grown). Plant pathogens are a special case, as generally it is not the population density, but the intensity of the disease that is estimated. The final goal may be to compare the pest population with the economic threshold in order to decide whether it is necessary to apply a control measure, to decide whether a pest control measure has been effective, or to decide whether a natural enemy is providing successful biological control. Population sampling is carried out accordingly to a sampling programme, which is the precise procedure followed to take the sample from the plot, and to process it using a sampling technique. Sampling programmes must be reliable, but also practical in terms of time and cost.
WHY	It is impossible to apply IPM without knowing the population density of pests and natural enemies in the plot, as the economic injury level is its cornerstone. As population monitoring is time consuming, the extension of IPM needs an increasing commitment from growers in this activity. The correct application of the sampling programme by advisers or growers is essential to produce reliable results and, consequently, to avoid making wrong decisions.
HOW	Population sampling is highly crop and pest dependent, so it will be difficult to explain in detail all the sampling techniques. It is better to focus on a small group of crops. On the other hand, it is an activity very suitable for demonstration in the field. **In classroom sessions:** ► Explain the concept of population sampling and stress its importance. ► Present and discuss ready-to-use sampling programmes. **During field visits:** ► Prepare a collection of sampling techniques (traps will probably form an important part). ► Carry out visual sampling, individually or in groups. ► Discuss the results, focusing on their possible variability and stressing the importance of doing it right.
SOURCES	► University of California IPM Manual Series: http://www.ipm.ucdavis.edu/IPMPROJECT/pubs.html ► On the ENDURE Information Centre: Keywords: measure > decision support / control > monitoring

Food Quality and Safety
6TH FRAMEWORK PROGRAMME