Grow the Crop

Handout 23

Scouting Procedures

HO Scouting Procedure

Agricultural Scouting is the systematic or regular monitoring of a crop or ornamental planting or landscape.

Scouting, or monitoring pest populations, is part of an Integrated Pest Management (IPM) system. IPM prescribes treating the portions of a farm or field that have identified higher than threshold levels of pests, rather than treating the whole field, resulting in using less applied farm chemicals. With the introduction of new genetically modified crops, it is important to have a basic knowledge what the technology implies on the specific crop, e.g. maize, cotton, soy bean. At present (2006) only these three crops are considered as genetically modified or "transgenic" and the scout should take note of the inherent characteristic of the crop with regards to resistance to specific pests. For example, Bt-cotton (genetically modified) provides resistance to bollworms on cotton, and the scouting results on this type of cotton maybe different from what is expected. The relevant data in each case should be presented when scouting for a specific purpose, be it pest control, or to monitor the expression of the technology in the plant or both.

For pest control and related damage, spotting signs of damage doesn't automatically mean you should take action. It all depends on the type of crop you are working with and which pest has most impact on the crop, the type of damage caused, the severity of infestation, and your own personal preferences. For instance, does the damage fall into any of the following categories?

- **Economic damage:** Some insects, such as termites, cause economic damage to a home, yard, or garden.

- **Health risk:** Some insects and related creatures are a concern because they carry disease or are detrimental to your health. A good example is the tick, one species of which is responsible for transmitting Lime disease, or mosquitoes of which some can transmit the malaria parasite.

After you identify a problem, determine the potential for damage and how much you or your landscape can tolerate. Once you know what you're up against, find out if the damage can be controlled with less-toxic strategies. Use the least harmful pesticides as a last resort.

Example: Scouting in the cotton field (Cotton Management Guide, revised 2006)

It is important to distinguish between conventional cotton and biotech cotton types. Biotech cotton types include bollworm resistant types such as Bt-cotton (i.e. NuOPAL and NuOPAL RR), and herbicide resistant cotton types (i.e. DeltaOPAL RR). The method of scouting on both conventional and biotech types is similar, but the management and interpretation of scouting results differ. For both conventional and biotech cotton, a cotton field must be investigated / scouted in such a way that the observations made are representative of the specific field. The field should be divided into blocks not larger than 15 hectare. The observations collected from such a block will then indicate the extent of the control to be applied to the specific block. In order to obtain a reliable sample of observations, plants need to be chosen randomly from the block. Choosing plants in 8 groups of 3 plants each,

moving diagonally across the field, is satisfactory (24 plants per block). Furthermore it is advisable to scout each block from a different direction each week. Scouting blocks must be chosen so that all the cotton in the block is of the same age and the block is not divided geographically. Cotton under rain fed and irrigated cultivation must be treated as separate units. For each block, a minimum sample of 24 plants should be randomly chosen and investigated for pests, except for spider mite that requires a sample of 48 plants.

For both conventional and biotech cotton types (bollworm resistant and herbicide tolerant types) 24 plants within each field and the entire plant, including young bolls and squares, should be examined thoroughly. The number of any pest found on the plant is recorded and if this is equal to or more than, the predetermined *economic control threshold*, control measures should be applied.

Examination of plants for bollworm (American, red and spiny)

The whole plant must be examined thoroughly. Particular attention should be paid to the upper plant parts, especially the squares, flowers and bolls. The numbers of bollworm eggs and larvae must be recorded on a suitable scouting sheet. Time taken to examine a single plant will depend on the age and size of plants. Approximately 5 minutes per plant can be used as a standard.

Bollworm resistant cotton:

In the case of bollworm resistant cotton, threshold levels are interpreted differently. The reason for this is that in instances of plant stress (i.e. drought or flooding) Bt-cotton plants may vary in the level of expression of the Bt-gene, especially in the flowers. This could create an opportunity for bollworm larvae to survive on Bt-cotton plants, which would provide a higher number of bollworm larvae found on a particular plant at any one time during scouting. One or more plants, which could exhibit this tendency to have more larvae, could create the impression that the field has many bollworm larvae and that the threshold is reached. The threshold level for bollworm on Bt-cotton is thus adapted to be interpreted as when more than 5 plants with bollworm larvae/24 plants are found, it would indicate that bollworm control should be considered. The emphasis is on the number of plants with 1 or more larvae, rather than the number of larvae per 24 plants.

Example:

Summary of scouting Procedures (cotton)

There are normally very specific procedures that are applied for scouting pests and diseases on various crops. Many of these scouting procedures have been scientifically determined and are recommended as such.

An example would be:

Scouting for bollworms on conventional (non-transgenic) cotton

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- Select 24 plants per field randomly, or in groups of 3 at 8 randomly selected sites to cover the whole field.

- Examine all plant parts, to include upper and under leaf surfaces, stems, flowers, flower buds (squares) and bolls.

- Identify and count the number of bollworms per plant and record on a recording sheet or on a pegboard.

After 24 plants have been scouted add up the total number of bollworms scouted. The learner should be able to report on the number of bollworms found per field, per week, and be able to monitor these pests over a period of time.

It is important to get the correct scouting procedures, as related to the types of pests and diseases that might be relevant to your specific type of crop. For instance, of all bollworms present in South Africa, only one kind is a cosmopolitan pest mostly on all crops. Scouting procedures differ from crop to crop as well as threshold values. For instance, American bollworm on maize does not reach as economically damaging levels on maize as on cotton. Some other pests, like the maize stalkborer may contribute to injury levels on maize and the same may be true for various other crops and associated pests.