

The Scout Decision

Many nurseries profess to follow an IPM program but do not employ a scout. If no scouting function is performed, there is little or no chance of early problem detection and identification. These nurseries often rely heavily on both scheduled and curative pesticide use to control a seemingly endless string off pest problems. Many of the non-chemical management options will not adequately function in the absence of the reconnaissance data gathered by a scout. The scout is the hinge pin on the IPM program door that allows it to function.

After committing to the scouting component of an IPM program, the search of a scout begins. Where does a nursery procure a scout? In the last 25 years, IPM programs have been implemented across many crops. The majority of the successful IPM programs have recruited scouts form outside the farm or nursery. In spite of this track record, there is till much debate concerning the “internal” versus the “external” scout in the ornamental nursery (Table 1).

Advantages	Disadvantages
Internal scout 1. Familiar with the nursery 2. Familiar with “normal” plant appearance 3. Already on the payroll 4. No risk of pest/pathogen entry form other nurseries 5. Confidentiality	1. Constant risk of being redirected to other nursery work 2. A full salary and fringe benefits line in nursery payroll 3. Pre-existing employee often has reduced scouting time 4. Other job responsibilities often limit scouting skill acquisition
External scout 1. Salary expended only for scouting time 2. Often provides own Worker’s Compensation 3. Can specialize in scouting, achieve higher skill level 4. Contract services often perceived by management to be more credible 5. Broader diagnostic network	1. Must learn plant production system, new plant species and their “healthy” appearance 2. Risk of pathogen/pest entry from scout’s other clients 3. Potential loss of confidentiality for nursery

A functional IPM program *can be* served successfully by either and external or internal scout. If an internal scout is chosen, he/she can be and owner, grower, or one or more employees. Be realistic with this choice! Although owners and growers have the ability and desire to scout, do they really have the time to dedicate to scouting each week to achieve the critically needed consistency in data collection? Other employees certainly have more time to achieve the goals of the scout, but may not have the knowledge base or the incentive to acquire it.

What is the perfect scout profile? Certain basic attributes are important in screening individuals for scouting positions. Enthusiastic and dedicated individuals are always preferred

for and job, especially for one with as much redundant activity as weekly or biweekly scouting.

Perhaps more important is the individual's background. Candidates with a horticultural background should be more immediately applicable to scouting for the simple reason that they should be able to spot the abnormal plant among many healthy plants. A person comfortable with the normal ornamental plant appearance and growth should be able to overview large areas of plant material, focusing on those with abnormal symptom development – wilt, leaf distortion, stunting, foliar spotting/blighting, stippling, etc. Scouts with nonhorticultural backgrounds can demonstrate higher levels of motivation than scouts from horticultural industries – perhaps a result of having to compensate for an initially deficient knowledge base. There are no reliable guidelines for choice of a scout. Certainly a “plant background” and familiarity with common disease/pest problems would be immediate assets, but a lot of successful scouting depends upon the individual's motivation and common sense.

In a workshop held at the 1993 annual meeting of the American Society of Agronomists, educators, independent crop consultants and others interested in crop advisory work (including IPM scouting) discussed their ideas of what an “agricultural practitioner” should be. They developed a list of the knowledge and skills needed by practitioners that reflect the important responsibilities for those doing crop advisory work. The duties and responsibilities of an IPM scout are only part of those of a crop adviser, but an ideal IPM scout would have most of the same characteristics (see Table 2).

Basic education	Scientific disciplines	Practical skills and knowledge	Personal attributes	Concepts that should be understood
English	agronomy	problem framing	ethical	IPM
math	horticulture	field diagnostics	self learning	ICM
chemistry	entomology	lab diagnostics	innovative	BMP
physics	soil science	know action of chemicals	creative thinking	sustainable agriculture
biology	plant physiology	human and personal relations	reflective thinking	soil and water conservation
history	plant pathology	communication		wetlands issues
	nematology	laws and regulations		alternative agriculture
	weed science	business practice		MEY

Once the source of the scout is defined, the level of scouting service must be determined so that the expectations of management are matched with the reality of scouting. Lines of communication and level of authority must be mutually agreed upon. Scouting services currently offered across horticultural and agricultural crops in the United States include the following functions:

- a) scheduled, systematic monitoring;
- b) systematic monitoring plus plant problem sampling and diagnosis; and
- c) systematic monitoring plus sampling/diagnosis plus disease/pest management advice.

The most common service offering from scouts is scheduled systematic monitoring of a crop. Nursery management and the scout need to define the level of scouting to be done throughout the nursery. Both should realize that thorough scouting of all plants within the nursery would be uneconomical. Key plants and key pests should be defined first. Scouts not only detect plant problems but can provide data as to numbers of plants affected and relative severity of problems on those plants, as well as specific pest or beneficial insect counts for threshold determination.

Many scouts can competently identify common insect/mite pests with use of a hand lens or dissecting microscope. Those scouts with a strong background in ornamentals production can be quite accurate with common foliar diseases as well. However, many occurrences of abnormal plant growth in the nursery due to nutrient imbalances, weather conditions, unusual or new pests or pathogens cannot be identified accurately by visual examination. Remember the underlying premise to the successful IPM program, **early detection and accurate identification of disease/pest problems.**

When the scout has achieved early reporting of plant problems, don't drop the ball at the identification stage! If you begin to manage the wrong plant disease or pest, what chance is there that the integrated pest management options will be both effective and economical? Confirm the identity of whatever abnormality the scout reports. Plant problem diagnosis is the second most important function behind the scouting activity. If no one within the nursery can follow through on problem diagnosis, delegate this function to the scout. Establish procedures in advance for collecting and submitting proper samples of undefined plant problems to appropriate diagnostic facilities (university, regulatory or private). Designate a plant disease clinic, insect identification service, nematode assay laboratory and soils/tissue testing laboratory to support the scouting effort. Make sample submission automatic so you will not lose the advantage that the scout has provided by early detection.

Scouts with strong backgrounds in production of nursery crops or ample professional experience may want to participate in the selection of preventative and management options for specific plant problems. If this is the case, it is important that the scout also be involved in the timely assessment of treatment efficacy.

Last, but certainly not the least important, is the task of record keeping. Both scout and nursery management share the responsibility of preserving the biological data generated by the scouting component of the IPM program. The incidence and timing of particular plant problems are unique to the nursery within its geographical location and within a given plant product mix. If a particular problem is encountered in one production cycle, there is a strong likelihood that it will be encountered again.

A scout can record data on record sheets similar to those on pages 11 through 15. These five pages give forms useful in scouting and integrated pest management. Scouting data can be used to predict production problems in future cycles, allowing use of more preventative options

and decreasing reliance on pest management tools. Additional valuable scouting services in the area of record keeping are a photographic log of plant problems, and/or an herbarium of pressed plant tissue exhibiting plant disease or pest injury symptoms. These can be used to train nursery personnel.

Scouts with strong backgrounds in production of nursery crops or ample professional experience may want to participate in the selection of preventative and management options for specific plant problems. In this situation, scouts take on the role of crop adviser and incur a higher level of legal liability for professional performance. This role is also more demanding of time and may limit the number of nurseries with which a scout contracts.

A variety of additional services can be provided by the scout that compliment time spent in the nursery. Such services include: nursery-wide scouting for horticultural health (see Chapter __), production of a detailed nursery map of structures, roads, irrigation, bed placement etc., posttreatment evaluation of pesticide applications, and IPM record keeping functions ranging from organization of scouting reports to compilation of disease/pest predictive calendars for future nursery production periods.

The incidence and timing of particular plant problems are unique to the nursery within its geographical location and within a given plant product mix. If a particular problem is encountered in one production cycle, there is a strong likelihood that it will be encountered again. In some nursery environments, scouts also serve in an educational capacity with provision of on-site education of nursery employees concerning key plant problems and their identification. This is accomplished by oral instruction as well as development of disease herbaria, insect collections (both harmful and beneficial), and photograph collections of major plant problems. These and other functions are aspects of the scouting service that must be negotiated between scout and nursery management.

Once the scout decision has been made, basic equipment and resources need to be assembled to execute the scout function. Basic scouting equipment is the same regardless of whether the scout is internal or external to the nursery. These basic tools are listed in Table 3. In some nurseries, specific services may be requested of the scout that will prompt the acquisition of other equipment such as a portable pH meter, a portable or desktop conductivity meter, and a dissecting, binocular microscope. Potential sources of this equipment is summarized in Appendices III–V.

Regardless of the level of scouting service chosen by a nursery client, all scouts benefit from the gradual acquisition of reference texts and articles that assist with the identification of a variety of plant insects, beneficials, mites, diseases, nematode injuries and abiotic plant problems. Suggested titles are summarized in the chapter “References for Scout-based IPM Programs in the Nursery.” Many of these references are particularly important to retain in the nursery as they support a higher level of confidence for all employees to participate in nursery scouting during the pursuit or normal nursery activities.

Basic equipment for nursery scouting

Clipboard
Nursery/greenhouse maps
Pencils and indelible markers
Scouting report forms
10 to 20x magnifier
White sheets of paper or paper plates
Yellow sticky cards, cups or plates
Double-sided sticky tape
Sweep and aerial insect nets
Measuring wheel, 100 ft. tape
Vinyl wire flags or fluorescent flagging tape
Styrofoam cooler
Aspirator
4-dram vials and rubbing alcohol
Plastic Ziploc bags
Soil sample probe
Trowel or small spade
Pocket knife
Pruning shears

Table 3. Basic equipment for nursery scouting.

Scouting Record Sheet (Side 1)

Location _____

Date _____ Plant _____

Scout Name _____ Pot Size _____

Time In _____ Time Out _____

Biased Sampling Comments:

Plant	Symptom (% Plant Damage)	# Lvs. w. Adult Pests	# Lvs. w. Immatures	% Pests Parasitized	Beneficial Pres./Abs.	Beneficial Type
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
%*						

*Percent of symptoms in plants in bench or bed

COMMENTS:

Scouting Record Sheet (Side 2)

IF SAMPLE TAKEN:

# _____	Disease ~	Insects/Mites ~	Nematodes ~	Salts/pH ~	Fertility T/M ~	**
# _____	Disease ~	Insects/Mites ~	Nematodes ~	Salts/pH ~	Fertility T/M ~	**
# _____	Disease ~	Insects/Mites ~	Nematodes ~	Salts/pH ~	Fertility T/M ~	**
# _____	Disease ~	Insects/Mites ~	Nematodes ~	Salts/pH ~	Fertility T/M ~	**
# _____	Disease ~	Insects/Mites ~	Nematodes ~	Salts/pH ~	Fertility T/M ~	**

**T/M = Tissue / Media analysis

SYMPTOM CODES:		PEST CODES:	BENEFICIAL CODES
Angular spots = AS	Root Galls =RG	Aphids = A	Assassin Bugs = AB
Blight = B	Root Lesions =RL	Borer = B	Emergences Holes = EH
Dead Leaves = DL	Root Rot =RR	Broad Mite =BM	Lacewings = LW
Distortion = D	Rust =R	Caterpillar = C	Lady Beetles =LB
Fasciation = F	Scorch =S	Eriophyid Mites =EM	Predaceous Mites = PM
Galls = G	Silvering/Russetting	Foliar Nema. =FN	
=S/R		Lacebugs =LB	
Holes = H	Sooty Mold	Leaf Miner =LM	
=SM		Mealybugs =MB	
Leaf Drop = LD	Spots =SP	Root-knot Nema. =RK	
Mines = M	Streak =SK	Root Mealybugs =RM	
Mosaic/Mottle = MO	Stunt =ST	Scales = S	
Powdery Mildew = PM	TipDieback =TD	Thrips =TH	
	Witches' Broom =WB	Whiteflies =WF	
	Yellowing =Y		

Pesticide Application Log

Date	Pesticide			Time		Target Pest*	Crop	Dilution rate ml/L	Quantity spray mix used	Application rate	Area/ No. pots	Applicator's initials
	Trade Name	Active Ingred. %	Regist. No.	Start	End							

* WF=Whiteflies APH=Aphids THR=Thrips SF=Shore flies FG=Fungus gnats SM=Spider mites
 OTH=Other (identify)

Sticky Card and Tape Data Form

Sticky Card Data *									Sticky Tape Data	
Plant/Location	Card No.	Date Placed	Date Inspected	Whiteflies	Thrips	Leafminers	Male scales	Other	Scales crawlers	Other

*Approximate number in a 1-inch vertical column.

Incoming Plant Material Inspection Sheet

Nursery_____

Location _____

[illegible]

