



Insect Monitoring





Appropriate monitoring underpins informed decisions

Decision Making
for Insect Management
in Grain Crops





Beat sheet monitoring

Decision Making
for Insect Management
in Grain Crops



Visual sampling for insects and crop symptoms



Soybean moth



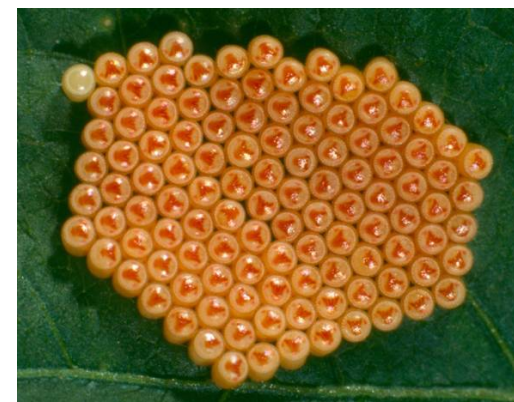
Soybean aphids



SLW



Small heli's



GVB egg raft



Bean podborer

Visual sampling for insects and crop symptoms



Etiella



Lucerne crown borer

Visual sampling for insects and crop symptoms



Soybean stemfly crop symptoms



Soybean stemfly



Monitoring

Why do we monitor?

- Minimise risk of crop damage
- Detect any changes in pest populations
- Determine if natural enemies keep pests in check
- Maximise effective control

Start monitoring at seedling stage





Frequency of sampling

Key considerations

- **Risk**
 - Seasonal pest abundance
 - Crop susceptibility/vulnerability
 - Management/control options available
 - Response time
- **Environmental factors**
 - Temperature
 - Rate of crop growth
 - Rate of pest population growth
 - Rainfall
 - Can reduce pest populations
 - Make sampling difficult/impossible



How many samples?

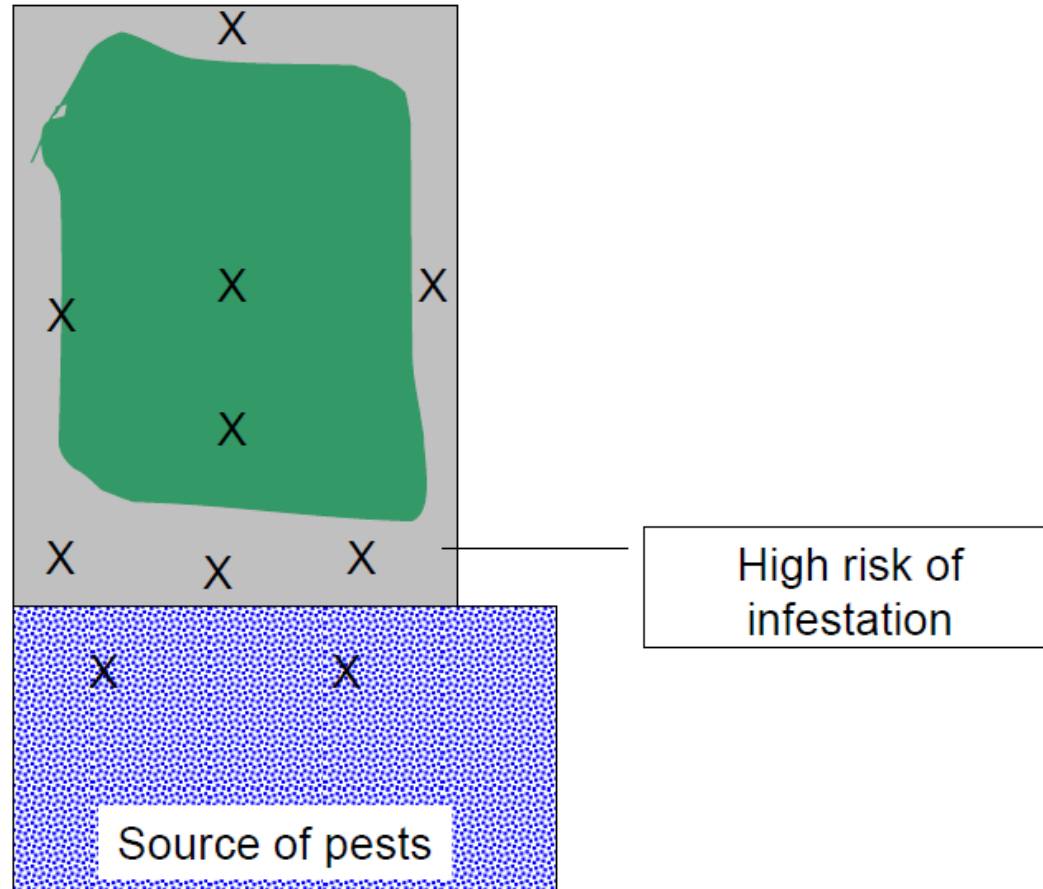
A compromise between time and precision

Be aware of variability between samples when averaging

- Use appropriate sampling strategy for target pest
- Experience with the pest can guide

Confidence (in estimates) **critical** as pest population approaches thresholds

Where to sample



X = sampling points

If pest distribution is patchy

Pest biology

- reproduction, infestation and rate of dispersal – hotspots

Crop

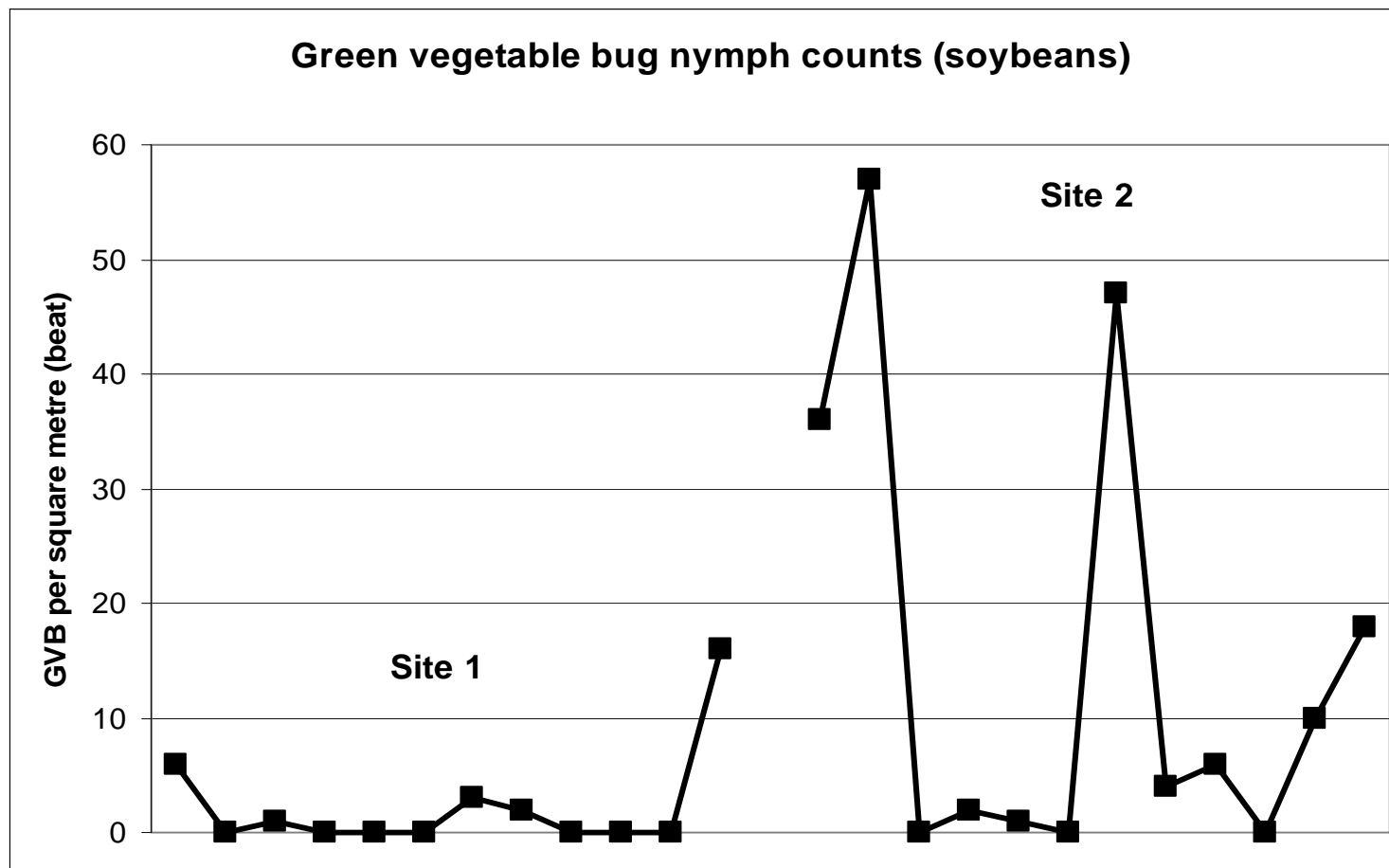
- difference in growth/attractiveness, uneven maturity

Random sampling best for patchy pests





How patchiness can influence estimates of pest numbers: Green vegetable bug



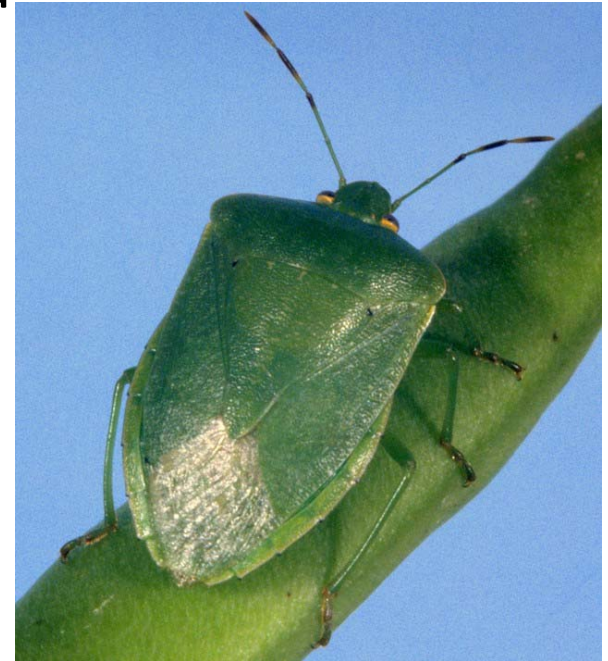


The threshold is very low

– do I need to bother with sampling?

Risks of not sampling

- applying insecticide when not needed
- timing of action – early or late
- missing other pests
- miss impact of beneficials/weather



Monitor beneficials

Monitor when checking for pests

Observe:

- Beneficials (eggs, adults and juveniles)
- Parasitism
- Parasitised eggs
- Changes in pest populations over time



Record keeping

Essential for:

- Estimating pest densities (assessing variability)
- Reviewing trends in pest populations
- Post-treatment assessments
- Assessing risk from season to season
- Planning
- Learning

Recording



BEAT SHEET RECORDS SOYBEANS		TRIAL:		Grower		Site		Sampler:																												
DATE:		TREATMENT:		REP:		Region		Note: <i>Tythus chinensis</i> is a small predatory mirid																												
DAT:		SAMPLE I						SAMPLE II						SAMPLE III						SAMPLE IV						SAMPLE V										
INSECT SPECIES		VS	S	SM	ML	L	BL	VS	S	SM	ML	L	BL	VS	S	SM	ML	L	BL	VS	S	SM	ML	L	BL	VS	S	SM	ML	L	BL					
CATERpillARS		0-3	3-7	7-13	13-23	23-28	>30	Moths	0-3	3-7	7-13	13-23	23-28	>30	Moths	0-3	3-7	7-13	13-23	23-28	>30	Moths	0-3	3-7	7-13	13-23	23-28	>30	Moths	0-3	3-7	7-13	13-23	23-28	>30	Moths
Heliothis																																				
Soybean & similar green loopers																																				
Mocis - bean looper (cream/orange)																																				
Cluster caterpillar (Spods)																																				
Bean Podborer																																				
Pantylia (brown looper)																																				
Beet webworm																																				
Other (specify)																																				
PODSUCK BUGS Instar:		eggs	1	2	3	4	5	Adult	eggs	1	2	3	4	5	Adult	eggs	1	2	3	4	5	Adult	eggs	1	2	3	4	5	Adult	eggs	1	2	3	4	5	Adult
GVB - Green vegetable bug																																				
Piezodorus - Redbanded shield bug																																				
Mirperus - Small brown bean bug																																				
Riptortus - Large brown bean bug																																				
Dictyotus - Brown stink bug																																				
Cletus sp.																																				
MIRIDS: SN = 1-2, MN = 3-4, LN = 5		SN						MN						A					SN						MN						A					
Green Mirids																																				
Brown Mirids																																				
Crop Mirid																																				
Broken backed bug																																				
Soy Aphid: None, Low, Med, High																																				
WHITEFLY N, L, M, H																																				
MONOLEPTA Beetle																																				
Zygrita - lucerne crown borer																																				
PREDATORS		SN						MN						A					SN						MN						A					
Tythus Adu black-Nym green																																				
Apple Dimpling Bug																																				
Brown Smudge Bug																																				
Nabis - Damsel bug																																				
Geocoris - Bigeyed bug																																				
Oechalia - Spined predatory bug																																				
Cermatulus - Glossy shield bug																																				
Ladybirds																																				
Red & Blue Beetle																																				
Lacewings																																				
Hoverflies																																				
SPIDERS																																				
ANTS (few, many)																																				
Parasitic Wasps, eg Trissocia																																				
Parasitic Flies eg Trichopoda																																				

Recording insect counts:

- Number of main species per sample
- Size of insects (usually stage or instar)
- Date
- Paddock location
- Crop stage
- Time of day/weather