

Below-ground Insect Pests of Peanut

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Burrower bugs



Hemiptera: Cydnidae

- Six species in peanuts, *Pangaeus bilineatus* most prevalent, sporadic late-season pest
- Host range: peanut, cotton, strawberry, spinach, wild plants
- Identification: small insects, note wing structure & spines on legs
- Overwintering stage: adult, under rocks, crop stubble, volunteer plants
- Behavioral clues:
 - eggs laid singly near roots & pods
 - adults/nymphs walk along soil cracks
 - soil moisture affect movement
 - adults attracted to white light

Damage by burrower bugs



- Damaging stages: adult, nymph
- Problem in conservation tillage
- Mouthparts are inserted into maturing kernel
- Light yellow/brown feeding spots “pitting”
- Loss in kernel weight and no. of sound kernel

Scouting techniques (burrower bugs)

- Spade sampling/soil corer >> sieving (5- to 12 mesh) (July – Aug.)
- ET = 2 bugs per three feet row
- Underutilized techniques: light trap, pitfall trap
- Direct examination of pods (after the full seed, R6, stage)



Pitfall trap with
metal guide & cover



Spade sampling

Whitefringed beetles

- Occurrence: native of S. Am., *Naupactus* species complex
- Host range: 350 host plants – peanut, cotton, cowpea, alfalfa, okra, grasses
- Identification: looks like a boll weevil but no snout, adult has white stripes on sides, larva plump with reduced head
- Overwintering stage: larvae (10-12 in. deep in soil), eggs
- Behavioral clues:
 - Emergence starts in April-July
 - 1 to 2 yr life cycle
 - Females have keen host-finding ability, can't fly...



Coleoptera: Curculionidae

Damage by whitefringed beetles

- Damaging stages: adult, nymph (chewing mps)
- Larvae – irregular holes in tap root, fatal to plants
- Root injury resembles wireworm, rootworm, white grub feeding
- Stand losses early & mid-season
- Can reach high pop. density – 186 per cu m
- Notched leaves??



Scouting techniques (whitefringed beetles)

- Soil cores/spade sampling prior to planting season
- Visual & beat cloth sampling for adult beetles (females)
- Underutilized techniques:
 - Sweep net for adult beetles
 - Floation technique for small larvae



Southern corn rootworm



- Occurrence: throughout U.S., immature form of spotted cucumber beetle (*Diabrotica u. howardi*)
- Host range: 200 host plants, major pest of corn, sweet potato, peanut
- Identification: wing pattern on adult beetles, larvae have 3 pr of legs
- Overwintering stage: adult beetles (mostly female beetles)
- Behavioral clues:
 - short overwintering period
 - high fecundity, eggs laid in soil at plant bases
 - adaptable to crop rotations??



Coleoptera: Chrysomelidae

Damage by southern corn rootworm



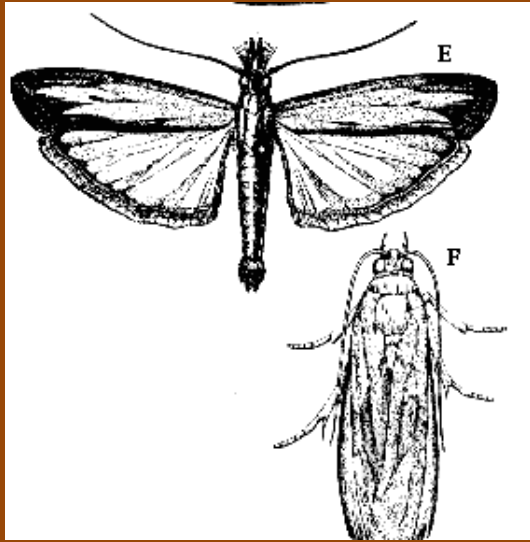
- Damaging stage: larvae
- Stand loss (early season damage)
- Larvae make a hole on one side of the pod and feed on kernel
- High OM, heavy soil >> high risk
- Adult beetles feed on leaves, but not a problem.
- Electronic risk index by NCSU >> high risk (score 70+) in wet years, low risk (score <60) in well-drained soil

Scouting techniques (southern corn rootworm)

- Larval infestation – scout close to pegging stage
- Spade sampling with a tray (larvae drop off quickly)
- Sweep net sampling for adults is reliable (10 sweeps/10 paces X 5 loc./A)...midmorning
- Check pods for circular holes at one end
- ET: fresh damage evident OR larvae present in 1/3rd sites



Lesser cornstalk borer



- Occurrence: one of the major insect pests of peanut, sporadic
- Host range: wide, hot-spots in peanut
- Identification: larvae are blue-green with purple bands. Moths are grayish, wings folded at rest, bushy abdomen (females)

- Overwintering stage: larvae/pupae

- Behavioral clues:

- able to survive dry soils (escapes predation)
- attracted to CO₂ and heat from plant roots
- larvae make sand tubes



Lepidoptera: Pyralidae

Damage by lesser cornstalk borer



- Damaging stage: larvae feed just below soil surface
- Larvae makes sand tubes on pods and stem
- High risk to peanut in hot dry years, sandy soil
- Spreads southern stem rot between plants



Scouting techniques (lesser cornstalk borer)

- Pod sampling – reliable indicator of infestation
- Scouting maps available from AWIS website – based on the estimation of borer days on a scale of 0 to 5
- ET – control when fresh damage is present OR when insect is recovered from 1/3rd sample sites



Wireworms



- Occurrence: many species (*Conoderus*), sporadic/key pest
- Host range: several plants (extended life cycle allows use of resources)
- Identification: larvae with cylindrical body, wriggle furiously when touched, adults are click beetles

- Overwintering stage: larva, beetle

- Behavioral clues:

- very attracted to CO₂ and heat from plant roots
- optimum SM for movement = 8 to 16%
- high mobility & chemical repellency



Coleoptera: Elateridae

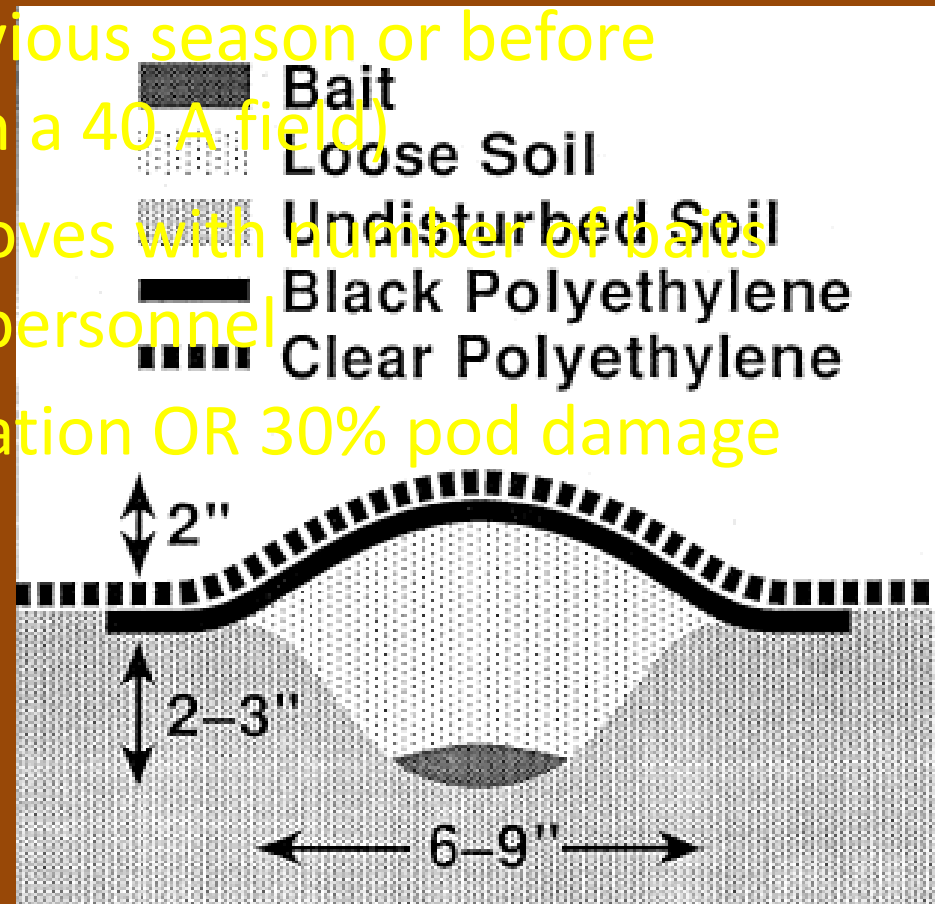
Damage by wireworms



- Damaging stage: larvae feed at various depths
- Early season damage to peanut >> loss of plant stand
- Doesn't like saturated SM, causes migration & spread
- Major problem following sod
- Larvae attack pod: make a large entry hole on a side
- Large larvae feeds with part of body outside

Scouting techniques (wireworms)

- Study field history – crop rotation, previous infestations
- Germinating seed baits in soil – a reliable “relative sampling” technique
- Seed baits could be put previous season or before planting peanut (about 12 in a 40 A field)
- Accuracy of seed baits improves with number of baits and experience of the field personnel
- ET = 1 wireworm per bait station OR 30% pod damage



Cutworms



Agrotis ipsilon



Agrotis subterranea

Lepidoptera: Noctuidae

- Occurrence: throughout AL, black cutworm (*Agrotis ipsilon*), granulate cutworm (*A. subterranea*) common
- Host range: over 60 crops and turf, major pest of peanut
- Identification: moths have dark forewings & white hindwings, greasy plump caterpillars, larvae curl when touched
- Overwintering stage: larva
- Damage:
 - cut seedlings at night, may climb plants
 - granulate CW bore into the middle of peanut pod (large hole)



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Scouting techniques (cutworms)

- Often detected when scouting for other insects
- Look directly under the base of cut plants
- Risk higher in dry conditions, well drained soils
- Pheromone trapping (bucket/wing traps for moths)



Pheromone lure & trap suppliers:

- Phero Tech Inc. <http://www.pherotech.com>
- Scentry Biologicals Inc. <http://www.scentry.com>
- Great Lakes IPM Inc., <http://www.greatlakesipm.com>
- Gemplers Inc. <http://www.gemplers.com>

Other sporadic insect pests

White grubs
(*Phyllophaga* spp.)



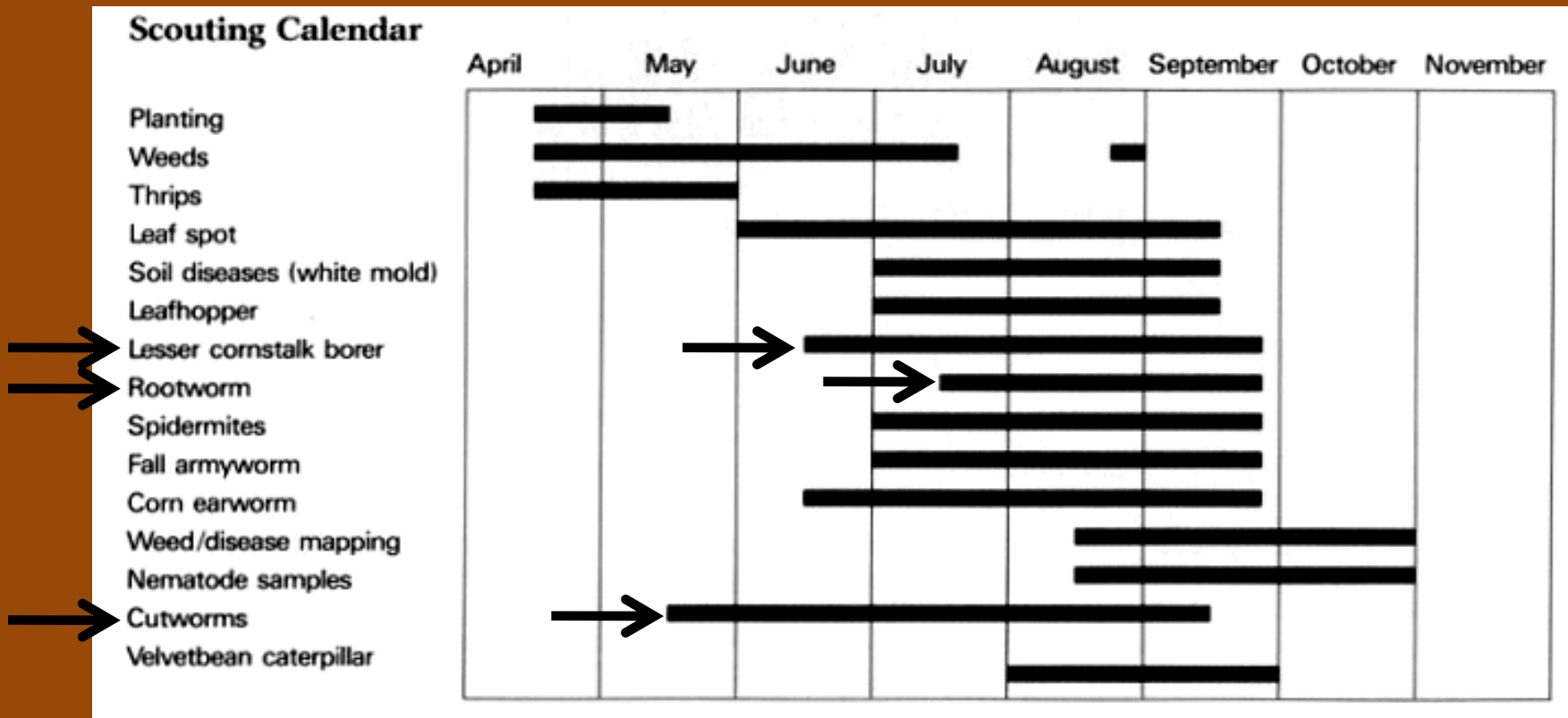
May/June Beetles
1-4 year life cycle
Problem after sod

Bahiagrass borer
(*Derobrachus brevicollis*)



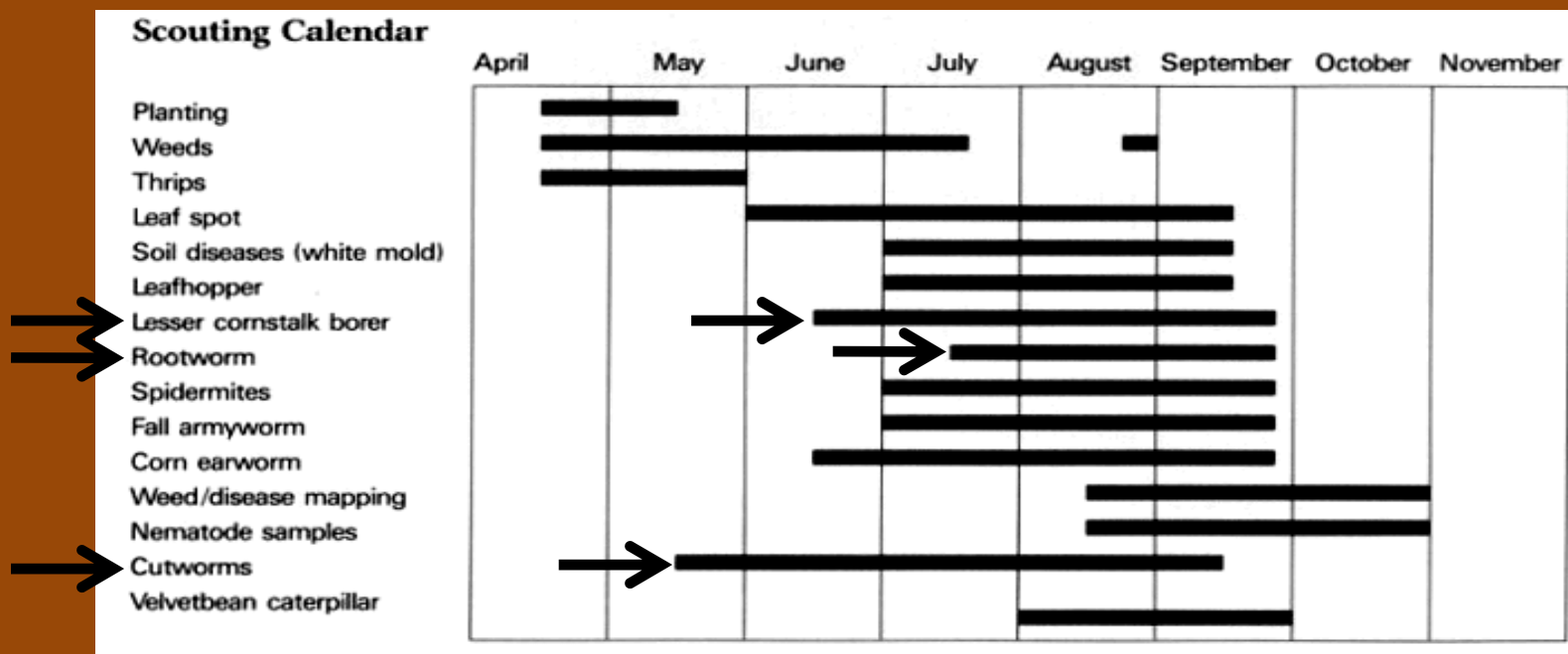
Large head of larva
Problem after bahiagrass

Scouting recommendations



- Draw soil samples in Winter or Spring.
- Reduce tendency to overestimate – increase sampling sites!
- Use a variety of sampling methods – pheromone traps and germinating seed bait stations are cost effective!

Scouting recommendations (contd.)



- Economic thresholds:

Soil-dwelling: burrower bug = 2 bugs per 3 foot row

Soil-air interface:

Cutworms, armyworms = 4 or more larvae per foot

LCSB, SCRW = fresh damage or insect at 30% sites

Wireworms = 1 per bait station or 30 % pod damage

Insecticides for soil insects



Burrower bugs

Chlorpyrifos
(banded over
row)

LCSB

Chlorpyrifos
(banded over
row and pegging
zone)

SCRW

Chlorpyrifos
(banded over
row and pegging
zone)

Wireworms

Chlorpyrifos
(preplant
broadcast spray
on soil +
incorporate OR
banded)

Cutworms

Indoxacarb
Cyfluthrin
Gamma-cyhalo.
Lambda-cyhalo.
Methomyl
Zeta-cypermeth.

- What affects insecticide efficacy? Timing & placement, soil temp. & moisture, microorganisms
- Additional insecticides need to be registered (suggestions?).

Take home message for today...

