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FIELD CORN IPM FIELD GUIDE FOR DELAWARE AND MARYLAND

Pre-Planting Decisions

1. Choose locally adapted disease resistant varieties. **(91)***
2. Fertilize and lime according to soil test recommendations. **(1584)**
3. Practice crop rotation. **(91)**
4. Use seed treatments for seedling diseases, seed corn maggot and wireworms. **(91)**
5. Use weed maps for pre-plant herbicide selections. **(238)**
6. Consider Bt corn varieties appropriate for your area for corn borer control. **(91)**

Pre-Planting Scouting:

Soil Insect Pest Management	Sampling Method	Sampling Frequency	Threshold	Notes
Wireworms	Bait Station: Make a 50-50 mixture of untreated corn & wheat seed. Soak in water overnight. In 5 sites per field, bury approximately 1 handful of the mixture 6 inches deep. Cover top of each site with clear plastic to heat soil quickly. After 2 weeks dig up, examine bait mixture & count # of wireworms.	Once 2 - 3 weeks prior to planting	one or more wireworms per bait station.	Conditions favoring wireworms: high organic matter soils, sod covers & heavy grass pressure the previous season.
White Grubs Wireworms, Slugs (831, 598, 1582)	Randomly select 1 sample (1 sq. ft. in area, 6 in. deep) per 10 acres (minimum of 5 samples). Count # of white grubs, wireworms, & slugs found in each sample.	Once 2-3 weeks prior to planting.	**Grubs & Wireworms:** 1/sq. ft. in sandy soils 2/sq. ft. in clay soils. **Slugs:** 3/sq. ft.	Conditions favoring grubs: planting into old sod, pasture, hay or set aside acreage.

Emergence to 4 Leaf Stage

Procedure	Sampling	Frequency	Estimate of Population Per Acre	Row Width	C Factor
Stand Counts	Count the number of plants in 20 feet of row by laying a 10 foot rope between rows & counting plants on either side of the rope. Trying to pick out representative rows, do this in 5 randomly selected locations for each 50 acres (equal to 100 row feet). Measure the distance between the rows. For fields >50 acres, average the plant populations for each 50 acre portion. Map each 50 acre section & population estimates for each section.	once at emergence repeat 2 weeks later	Multiply the number of plants in 100 ft. of row by the "C factor which is deter-mined by row width. Example: Total stand count for 100 row ft. = 130 plants; row width = 30 inches. 174.24 (C factor) x 130 = 22,651 plants/acre **Plant populations generally range from 18,000 to 26,000 plants/acre.**	19 20 22 24 26 28 **30** 32 34 36 38 40	275.11 261.36 237.60 217.80 201.05 186.69 **174.24** 163.35 153.74 145.20 137.56 130.68

Emergence to 4 Leaf Stage, continued

Procedure	Sampling	Frequency	Threshold	
			Weed Species	**# weed/25 sq. ft.**
Weed Counts	Randomly choose 10 sites per field. Measure a 25 square foot area at each site. Count and record the number of each species of weed within each 25 square foot site.	weekly for 6 weeks after plant emergence	annual grasses	20
			bur cucumber	1
			giant ragweed	1
			cocklebur	3
			velvetleaf	3
			jimsonweed	3
			lambsquarters	5
			morning glory	5
			pigweed	5
			ragweed	5
			smartweed	5

Pest	Damaging Stage	Monitored Stage	Sampling Method	Sampling Frequency	Threshold	Notes
Cutworms **(142, 604, 831)**	larval	larval	Examine 10 consecutive plants in 10 sites throughout the field. Record the number of plants with feeding damage on leaves (small cutworms make small holes in the leaves) and the number of cut plants (larger cutworms bore into or cut the stems).	weekly	1-2 leaf corn: 3% cut or 10% with feeding damage 3-4 leaf corn: 5% cut and larvae present	Late planted, minimum till fields with heavy spring weed growth or poorly drained soils are the most likely to have cutworm problems.
Slugs	adult	adult	**Method 1:** Examine 10 plants in 10 sites. Turn over surface trash and dirt clumps next to each plant. Record # of slugs per plant. Slug leaf feeding damage is ragged looking and slime trails are often visible.		5 slugs/plant	No-till fields & field with heavy layers of crop refuse, manure & weeds are most likely to have slugs. Slug problems most severe during cool wet springs.
Slugs **(405, 406, 407, 408)**	adult	adult	**Method 2:** In 10 sites dig holes 4 inches in diameter and 6 inches deep. Cover them with asphalt shingles wrapped in aluminum foil. After several nights, check holes, count # of slugs. **(405)**		5 slugs/hole if corn has < 5 leaves	Slugs exhibit homing behavior & tendency to aggregate. The foil keeps the hole dark, cool & moist - ideal for slugs. **(405, 406, 407, 408)**
True Armyworm **(604)**	larval	larval	Examine 10 plants in 10 sites checking the whorls for larvae and signs of infestation. True armyworm feeding is characterized by ragged, irregular holes in the whorl leaves of small plants.	weekly	25% plants infested and larvae < 1 inch.	
Common Stalk Borer **(831)**	larval	larval	Examine 10 plants in 10 sites by checking the whorls for larvae and signs of infestation.	weekly	2 leaf stage: 4% infested plant 3 leaf stage: 6% infested plants 4 leaf stage: 10% infested plants	
Flea Beetle **(604)**	adult	adult	Examine 10 plants in 10 sites for beetles & damage.	weekly	5-6 beetles per plant and 50% plants with damage.	Flea beetle feeding results in bleached out looking spots or strips on leaves.

5 Leaf Stage to Silking

Pest	Damaging Stage	Monitored Stage	Sampling Method	Sampling Frequency	Threshold	Notes
True Armyworm **(182, 604)**	larval	larval	Examine 10 plants in 10 sites, checking whorls for larvae & signs of infestation.	weekly	25% plants infested & larvae < 1 inch.	Damage occurs in late spring.
Northern Corn Rootworm Western Corn Rootworm	larval adult	adult	Direct Visual Counts: Examine 10 plants in 10 sites and count # of rootworm beetles/plant. Sticky Card Traps: Use Olsen 4 x 6 yellow sticky card at a density of 1 per 5 acres. Record the average # of beetles caught per trap per week.	weekly for 3-4 wks. from late July thru mid-Aug.	Direct Visual Count: 2-3 year corn 0.25 beetles/plant ≥ 4 year corn 2.0 beetles/plant Sticky Card Count: 2-3 year corn 10 beetles/week ≥ 35 beetles/week	The potential for rootworm problems depends on soil type and number of years in continuous corn. Hot, sandy soils have fewer rootworm problems. Field not in corn the previous year should not have problems. Fields in continuous corn for 2-3 years have more problems than fields in continuous corn for ≥ 4 years.
European Corn Borer **(424, 604)**	larval	larval	Examine 10 plants at 10 sites for infested plants. Pull a few whorls out at each site to be sure of pest species and to estimate average size.	weekly	Irrigated corn = 50% plants infested Non-irrigated = 80% plants infested.	Small larvae feed on the leaves down in the whorls causing a characteristic "windowpane" or "shothole" pattern.
Fall Armyworm **(114, 178, 604)**	larval	larval	Examine 10 plants at 10 sites for infested plants. Pull a few whorls out at each site to be sure of pest species and to estimate size.	weekly	75% of plants with 1 worm or 50% of plants with 2 or more worms.	Damage occurs from mid-summer through fall. Fall armyworms feed on the tassels & whorl leaves. Feeding damage consists of large irregular holes and notches in the leaf margins. Plenty of frass usually present.

Pre-Harvest

Disease	Symptoms	Sampling Method	Sampling Frequency	Threshold	Notes
Stalk Rot **(1582)**	Spongy lower stalks	Check 10 plants in 10 sites for stalk rot by pinching the lower 2 or 3 internodes.	Once at end of season.	Harvest early if 10-15% show disease.	Stalk rots are caused by a variety of fungi. Symptoms of infection are a spongy lower stalk, with the pith shredded and often discolored. Stalks are weakened and susceptible to lodging.

***Bolded numbers in parenthesis indicate sources of additional information found in the IPM database by this special reference number.**

Scouting procedures, thresholds, and crop management recommendations have been compiled from a number of sources and may not be valid for all areas within the Mid-Atlantic Region. They are meant to be used as guidelines. As such, they should be validated on small acreages before relying on them. No guarantee of their validity, success, or failure to perform in the field is implied or expressed. Consult your local Cooperative Extension for additional information or assistance.