Rutgers Cooperative Extension
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SPINACH
INTEGRATED WEED MANAGEMENT FIELD GUIDE

Year Prior to Planting Spinach

PROCEDURE	HOW TO SAMPLE	USE OF THIS INFORMATION	ADDITIONAL NOTES
Analysis of Soil Texture, Organic Matter, and pH	Using a county soil map, identify the different soils in the field. Take a sample from each area where soil types differ. Submit to lab for analysis of texture by mechanical analysis and for analysis of Cation Exchange Capacity (CEC), organic matter (OM), and pH.	With this information an integrated weed management program can be designed using cultural and/or chemical controls for each soil type in a field. Soil type and pH differences within a field affect rate of application, carryover and other interactions.	Mechanical analysis generally only needs to be done once unless there is significant erosion or changes in cropping patterns. CEC and pH should be analyzed annually. Organic matter analysis should be done every 5 - 10 years.

Pre-Harvest of Current Crop

Scout once prior to harvest to determine weed potential for next year's spinach crop.

Weeds	Sampling	Threshold	Notes
Horsenettle Groundcherry Yellow Nutsedge Canada Thistle Common Milkweed Hemp Dogbane Bindweed spp. Johnsongrass Bermudagrass (277, 1326)*	Scout field in a zigzag pattern. Sample 10 random locations 1 square yard in size or 10 ft. of row, whichever pattern best suits existing conditions. Map the location of these weeds.	presence	Select control measures to eradicate these perennials for the next cropping season. See "Postharvest Perennial Weed Control" for treatment options. **(292)**
Summer Annuals, Black Nightshade, Hairy Nightshade, Common Cocklebur, Jimsonweed (277, 1326)	Scout as outlined above for the presence of existing weeds. Potential weed problems are best identified by a non treated weedy check. Identify the weeds, count # of each species. Note whether specific weeds are scattered throughout the field or predominate in one area of the field.	**Number of weeds per 10 ft. of row or 1 sq. yd**. < 1 weed = very light 1-4 weed = light 4-10 weeds = medium 10-100 weeds = heavy > 100 weeds = very heavy	Untreated check provides most reliable information for planning the weed control strategy for the coming season.

Production Year

Pre-planting Decisions:

1. Use the information obtained from the previous year's scouting to select recommended control strategies for those weeds.
2. Match preplant incorporated and preemergence herbicide rates to soil type and percent organic matter in each field. **(292)**

Spring Planted Spinach

Three Weeks After Planting

Weeds	Sampling	Frequency	Threshold
Zero Tolerance Weeds = Nightshades, Horsenettle, Yellow Nutsedge, Morning Glory, Jimsonweed, Common Cocklebur, Canada Thistle, Common Milkweed, Hemp Dogbane, Bindweed spp., Johnsongrass, Bermudagrass, Quackgrass **Summer Annuals**	In a zigzag pattern, scout 1 sq. yd. in 5 random locations and 10 ft. of row in another 5 random locations. Identify and count # of each weed species. Map location of zero tolerance weeds. Determine whether weeds are predominantly within the row or between rows.	Once approximately 3 weeks after planting.	**# weeds/10 ft. row or 1 sq. yd.** — **Action** Zero Tolerance Weeds: Presence — Control required. Summer annuals: < 0.25 weed — None 0.25 - 1 weed — Control may be required. > 1 weed — Control required Whether weeds are within the row or between the row determines if cultivation will be an effective control.
All Weeds	Same as above.	1 week after control measures are implemented from the 3 week scouting.	This information is used to evaluate how well controls worked.

Five to Six Weeks after Planting

Weeds	Sampling	Frequency	Threshold	Notes
Horsenettle, Groundcherry, Black Nightshade, Hairy Nightshade, Yellow Nutsedge, Morning Glory, Jimsonweed, Canada Thistle, Common Milkweed, Dogbane, Bindweed spp., Johnsongrass, Bermudagrass **Annuals**	Scout one square yard in 5 random locations and 10 ft. of row in another 5 random locations in the field. Map location of perennial weeds.	Once, prior to harvest.	Presence	Use this scouting information to determine if there are weeds present which will interfere with harvest. Use the information about perennial weeds to plan a cleanup program after spinach harvest.

Fall Planted and Overwintered Spinach
Three to Four True Leaves (3-5 weeks after seeding)

Weeds	Sampling	Frequency	Threshold
Zero Tolerance Weeds (ZTW): Nightshades, Horsenettle, Yellow Nutsedge, Morning Glory, Jimsonweed, Common Cocklebur, Canada Thistle, Common Milkweed, Hemp Dogbane, Bindweed spp., Johnsongrass, Bermudagrass, Quackgrass **Summer or Winter Annuals**	In a zigzag pattern, scout 1 sq. yd. in 5 random locations and 10 ft. of row in another 5 random locations. Identify species, count # of each weed species. Map location of zero tolerance weeds. Determine whether weeds are predominantly within the row or between rows.	Once approximately 3 - 5 weeks after planting.	**# weeds/10 ft. row or 1 sq. yd.** — **Action** ZTW: Presence — Control required. Summer annuals: < 0.25 weed — None 0.25 - 1 weed — Control may be required. > 1 weed — Control required Whether weeds are within the row or between the row determines if cultivation will be an effective control.
All Weeds	Same as above.	1 week after control measures are implemented from the 3 week scouting.	This information is used to evaluate how well controls worked.

Week of October 20

Weeds	Sampling	Threshold
Perennial/Zero Tolerance Weeds (ZTW): Nightshades, Horsenettle, Yellow Nutsedge, Morning Glory, Jimsonweed, Common Cocklebur, Canada Thistle, Common Milkweed, Hemp Dogbane, Bindweed spp., Johnsongrass, Bermudagrass, Quackgrass **Winter Annuals**	Sample in the same manner as outlined above for the three to four true leaves scouting. The purpose of this scouting is to determine if controls from the previous scouting worked and if further controls are needed.	**# weeds/10 ft. row or 1 sq. yd.** — **Action** ZTW: Presence — Control required. Summer annuals: < 0.25 weed — None 0.25 - 1 weed — Control may be required. > 1 weed — Control required Whether weeds are within the row or between the row determines if cultivation will be an effective control.

Late November - Early December

Weeds	Sampling	Frequency	Threshold
Winter Annuals	In a zigzag pattern, scout 1 sq. yd. in 5 random locations and 10 ft. of row in another 5 random locations. Identify and count # of each weed species.	once around Thanksgiving.	**# weeds/10 ft. row or 1 sq. yd.** — **Action** Winter annuals: < 0.25 weed — None 0.25 - 1 weed — Control may be required. > 1 weed — Control required
Winter Annuals	Use same sampling pattern	2-3 weeks after	The purpose of this scouting is to determine how controls instituted

		implementing controls	after the last scouting worked.

Late Winter (March)

Weeds	Sampling	Frequency	Threshold
Winter Annuals **Perennials**	In a zigzag pattern, scout 1 sq. yd. in 5 random locations and 10 ft. of row in another 5 random locations. Identify species, count # of each weed species. Map location of perennials. Determine whether weeds are predominantly within the row or between rows.	Once about the time that a nitrogen fertilizer application would be made.	**# weeds/10 ft. row or 1 sq. yd.** **Action** Perennial Weeds: Presence Control required. Winter annuals: < 0.25 weed None 0.25 - 1 weed Control may be required. > 1 weed Control required Whether weeds are within the row or between the row determines if cultivation will be an effective control.
All Weeds	Same as above.	2 - 4 weeks (depending on weather) after control measures are implemented from the above scouting.	This information is used to evaluate how well controls worked.

Pre-harvest

Weeds	Sampling	Frequency	Threshold	Notes
Perennial or Zero Tolerance Weeds (see list above) **Annuals**	Scout one square yard in 5 random locations and 10 ft. of row in another 5 random locations in the field. Map location of perennial weeds.	Once, prior to harvest.	presence	Use this scouting information to determine if there are weeds present which will interfere with harvest. Use the information about perennial weeds to plan a cleanup program after spinach harvest.

***Bolded numbers in parenthesis indicate sources of additional information found in the Mid-Atlantic 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 Agent for additional information or assistance.