


Given Below are estimated economical threshold values for injurious (pathogenic) nematodes on cotton. Attempting to establish a strict threshold value is folly, as local environmental factors such as water, heat, wind, soil type all come into play when assessing stress caused by pathogenic nematodes. However, some line must be drawn, and I have done that for three seasons. The population dynamics of one nematode may not follow another. For example, *Xiphinema* is often higher in the spring and late fall than in mid-summer. In my opinion there are four nematodes that are extreme pests; the reniform, the root knot, the lance and the sting. In addition, there are seven highly pathogenic nematodes: the dagger, cystoid, cyst, needle, lesion, stubby root, and stunt. The spiral and ring nematodes can be injurious if their numbers are high enough.

Nematodes Per 100 cm ³ soil	Threshold Levels		
	Early Spring April - May	Mid Summer July - August	Early Fall Sept - October
A.Stylelet Forms			
Aphelenchoides	+	+	+
Aphelenchus	+	+	+
Belonolaimus (Sting)	1	1	1
Criconema/Mesocriconema (Ring)	200	400	600
Ditylenchus (Stem)	No Data	No Data	No Data
Dorylaimus/Dorylaimida	No Data	No Data	No Data
Helicotylenchus (Spiral)	500	600	800
Hemicycliophora	No Data	No Data	No Data
Heterodera (Cyst)	60	100	100
Hoplolaimus (Lance)	15	25	40
Meloidodera (Cystoid)	10	25	50
Meloidogyne (Root Knot) juveniles	25	50	100
Longidorus (Needle)	1	1	1
Paratrichodorus (Stubby Root)	25	50	100
Paratylenchus (Pin)	No Data	No Data	No Data
Pratylenchus (Lesion)	25	50	100
Rotylenchus	No Data	No Data	No Data
Rotylenchulus (Reniform)	25	50	100
Tylenchorhynchus/Quinisulcius (Stunt)	25	50	50
Tylenchus/Psilenchus	+	+	+
Xiphinema (Dagger)	40	40	40
Other:			
B.Non-Stylelet Forms	++	++	++
Nematodes Per Gram Dry Root			
Hoplolaimus (Lance)	50	100	150
Pratylenchus (Lesion)	500+++	400	1000
Meloidogyne (Root Knot)	50	100	150
Other:			

Comments: + = Fungal Feeders, no threshold value assigned
 ++ = Non-pathogenic to cotton plants
 +++ = Lesion often high in young plants due to small root mass concentrating them; but plants can outgrow feeding effects of lesion nematodes under this number.
 = Severely pathogenic nematodes

Threshold levels are those levels of nematodes that would reduce yields by 10%.



Ward Laboratories, Inc.
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Nematode Threshold Levels Crop = Corn

www.nematest.com

Given Below are estimated economical threshold values for injurious (pathogenic) nematodes on corn in Nebraska and bordering states. It is a slight modification of my first list printed in 1982. Attempting to establish a strict threshold value is folly, as local environmental factors such as water, heat, wind, soil type all come into play when assessing stress caused by pathogenic nematodes. However, some line must be drawn, and I have done that for three seasons. The population dynamics of one nematode may not follow another. For example, *Xiphinema* is often higher in the spring and late fall than in mid-summer. In my opinion, there are eight severely pathogenic nematodes: the sting, lance, cystoid, needle, lesion, stubby root, stunt, and dagger. The spiral and ring nematodes if high enough can be injurious. Root knot damages corn in Southern United States. Soybean cyst nematode (SCN) does not occur on corn.

Nematodes Per 100 cm ³ soil	Threshold Levels		
	Early Spring April - May	Mid Summer July - August	Early Fall Sept - October
A.Stylelet Forms			
Aphelenchoides	+	+	+
Aphelenchus	+	+	+
Belonolaimus (Sting)	1	1	1
Criconema/Mesocriconema (Ring)	200	400	600
Ditylenchus (Stem)	No Data	No Data	No Data
Dorylaimus/Dorylaimida	No Data	No Data	No Data
Helicotylenchus (Spiral)	400	600	800
Hemicycliophora	No Data	No Data	No Data
Heterodera (Cyst)	++	++	++
Hoplolaimus (Lance)	15	25	40
Meloidodera (Cystoid)	10	25	50
Meloidogyne (Root Knot) juveniles	50	100	250
Longidorus (Needle)	1	1	1
Paratrichodorus (Stubby Root)	25	50	100
Paratylenchus (Pin)	No Data	No Data	No Data
Pratylenchus (Lesion)	25	50	100
Rotylenchus	No Data	No Data	No Data
Rotylenchulus (Reniform)	No Data	No Data	No Data
Tylenchorhynchus/Quinisulcius (Stunt)	25	50	50
Tylenchus/Psilenchus	+	+	+
Xiphinema (Dagger)	40	40	40
Other:			
B.Non-Stylelet Forms	++	++	++
Nematodes Per Gram Dry Root			
Hoplolaimus (Lance)	50	100	200
Pratylenchus (Lesion)	500+++	400	1000
Meloidogyne (Root Knot)	50	100	300
Other:			

Comments: + = Fungal Feeders, no threshold value assigned
 ++ = Non-pathogenic to corn plants
 +++ = Lesion often high in young plants (2-6 leaf) due to small root mass concentrating them; but plants can outgrow feeding effects of lesion nematodes under this number.
 = Severely pathogenic nematodes

Threshold levels are those levels of nematodes that would reduce yields by 5-8 bu/acre.

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2018 Nematode Threshold Levels Crop = Golf Greens/Turf

www.nematest.com

Given Below are estimated threshold values for injurious (pathogenic) nematodes on golf courses or turf grown anywhere in the USA. It is a slight modification of my first list printed in 1996. Attempting to establish a strict threshold value is folly, as local environmental factors such as water, heat, wind, soil type all come into play when assessing stress caused by pathogenic nematodes. However, some line must be drawn, and I have done that for three seasons, however that may not be appropriate for courses in FL or TX as it is for central USA. Three nematodes (sting, lance, and root knot) have caused most of the damage that I have seen, but in my opinion, there are five other damaging ones: the needle, lesion, stubby root, stunt, and dagger. The spiral, ring and Hemicycliophora nematodes can be injurious if found in high numbers.

Nematodes Per 100 cm ³ soil	Threshold Levels		
	Early Spring April - May	Mid Summer July - August	Early Fall Sept - October
A.Stylet Forms			
Aphelenchoides	+	+	+
Aphelenchus	+	+	+
Belonolaimus (Sting)	1	1	1
Criconema/Mesocriconema (Ring)	300	400	600
Ditylenchus (Stem)	No Data	No Data	No Data
Dorylaimus/Dorylaimida	No Data	No Data	No Data
Helicotylenchus (Spiral)	400	600	800
Hemicycliophora (Sheath)	150	150	150
Heterodera (Cyst)	++	++	++
Hoplolaimus (Lance)	15	25	40
Meloidodera (Cystoid)	10	25	50
Meloidogyne (Root Knot) juveniles	50	100	150
Longidorus (Needle)	1	1	1
Paratrichodorus (Stubby Root)	25	50	100
Paratylenchus (Pin)	No Data	No Data	No Data
Pratylenchus (Lesion)	25	50	100
Rotylenchus	No Data	No Data	No Data
Rotylenchulus (Reniform)	No Data	No Data	No Data
Tylenchorhynchus/Quinisulcius (Stunt)	25	50	100
Tylenchus/Psilenchus	+	+	+
Xiphinema (Dagger)	40	40	40
Other:			
B.Non-Stylet Forms	++	++	++
Nematodes Per Gram Dry Root			
Hoplolaimus (Lance)	50	75	100
Pratylenchus (Lesion)	300+++	400	600
Meloidogyne (Root Knot)	50	100	150
Other:			

Comments: + = Fungal Feeders, no threshold value assigned
 ++ = Non-pathogenic to turf plants
 +++ = Lesion often high in young plants due to small root mass concentrating them; but plants can outgrow feeding effects of lesion nematodes under this number.
 = Severely pathogenic nematodes

Threshold levels are those levels of nematodes that would reduce stand by 25%.



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2018 Nematode Threshold Levels Crop = Soybeans

www.nematest.com

Soybean Cyst Nematode (SCN) *Heterodera glycines* is a severe pathogen on soybeans. It has been spreading from eastern USA into the central states following river systems initially; now over entire states east of Nebraska. It arrived in Nebraska (fields along the Missouri River) about 1988 and now extends over the eastern third of Nebraska. The same eight (sting, lance, cystoid, needle, lesion, stubby root, stunt, & dagger) "bad" nematodes on corn will injure soybeans plus two more; root knot and reniform. The spiral nematode increases greatly on soybeans (3X as much compared to corn) in just one growing season, but soybeans can handle 500-700 without much damage. However, the worst nematode is SCN. Three extraction values are given below: soil, cyst, and root. Soil SCN threshold value is based upon juveniles seen. Cyst threshold value is 1000-1200 eggs/juveniles per 100 cc of soil. Given below are estimated economical threshold values (the numbers it would take to reduce yield by 5-8%) for injurious nematodes in soybean fields in Nebraska or bordering states. Trying to establish strict threshold values is folly, as local environmental factors (temperature, water, soil type, etc.) all come into the mix when assessing stress caused by injurious nematodes.


Soil Nematode Extraction	Threshold Levels		
	Early Spring April – May	Mid Summer July – August	Early Fall Sept - October
Nematodes Per 100 cm³ soil			
A.Stylet Forms			
Aphelenchoides	+	+	+
Aphelenchus	+	+	+
Belonolaimus (Sting)	1	1	1
Criconema/Mesocriconema (Ring)	200	400	600
Ditylenchus (Stem)	No Data	No Data	No Data
Dorylaimus/Dorylaimida	No Data	No Data	No Data
Helicotylenchus (Spiral)	500	600	800
Hemicylophora	No Data	No Data	No Data
Heterodera (Cyst) SCN juveniles	60	100	100
Hoplolaimus (Lance)	15	25	40
Meloidodera (Cystoid)	10	25	50
Meloidogyne (Root Knot) juveniles	50	100	150
Longidorus (Needle)	1	1	1
Paratrichodorus (Stubby Root)	25	50	100
Paratylenchus (Pin)	No Data	No Data	No Data
Pratylenchus (Lesion)	25	50	100
Rotylenchus	No Data	No Data	No Data
Rotylenchulus (Reniform) Not found in Nebraska	25	50	100
Tylenchorhynchus/Quinisulcius (Stunt)	25	50	50
Tylenchus/Psilenchus	+	+	+
Xiphinema (Dagger)	40	40	40
Other:			
B.Non-Stylet Forms	++	++	++
SCN Cyst extraction per 100 cm³ eggs/juveniles	1000-1200	1000-1200	1000-1200
Root Nematode Extraction as per gram dry root			
Hoplolaimus (Lance)	50	100	150
Pratylenchus (Lesion)	500+++	400	1000
Meloidogyne (Root Knot)	50	100	150
Other:			

Comments: + = Fungal Feeders, no threshold value assigned
 ++ = Non-pathogenic to soybean plants
 +++ = Lesion often high in young plants due to small root mass concentrating them; but plants can outgrow feeding effects of lesion nematodes under this number.
 = Severely pathogenic nematodes

Threshold levels: numbers of nematodes that would reduce yields by 5-8%.

Given Below are estimated threshold values for injurious (pathogenic) nematodes on wheat and/or small grain grown in central USA. Attempting to establish a strict threshold value is folly, as local environmental factors such as water, heat, wind, soil type all come into play when assessing stress caused by pathogenic nematodes. However, some line must be drawn, and I have done that for three seasons, however that may not be appropriate for areas in the southern USA as it is for central USA. Five nematodes (sting, lance, lesion, root knot, and cereal nematode) have caused most of the damage that I have seen, but in my opinion, there are four other damaging ones: the needle, stubby root, stunt, and dagger. The spiral and ring nematodes can be injurious if found in high numbers. I have not seen the cereal nematode in samples received.

Nematodes Per 100 cm ³ soil	Threshold Levels		
	Early Spring April - May	Mid Summer July - August	Early Fall Sept - October
A.Stylelet Forms			
Aphelenchoides	+	+	+
Aphelenchus	+	+	+
Belonolaimus (Sting)	1	1	1
Criconema/Mesocriconema (Ring)	200	400	600
Ditylenchus (Stem)	No Data	No Data	No Data
Dorylaimus/Dorylaimida	No Data	No Data	No Data
Helicotylenchus (Spiral)	400	600	800
Hemicycliophora (Sheath)	150	150	150
Heterodera (Cereal Cyst)	10	25	50
Hoplolaimus (Lance)	15	25	40
Meloidodera (Cystoid)	10	25	50
Meloidogyne (Root Knot) juveniles	50	100	150
Longidorus (Needle)	1	1	1
Paratrichodorus (Stubby Root)	25	50	100
Paratylenchus (Pin)	No Data	No Data	No Data
Pratylenchus (Lesion)	25	50	100
Rotylenchus	No Data	No Data	No Data
Rotylenchulus (Reniform)	No Data	No Data	No Data
Tylenchorhynchus/Quinisulcius (Stunt)	25	50	50
Tylenchus/Psilenchus	+	+	+
Xiphinema (Dagger)	30	30	30
Other:			
B.Non-Stylelet Forms	++	++	++
Nematodes Per Gram Dry Root			
Hoplolaimus (Lance)	50	100	150
Pratylenchus (Lesion)	300+++	400	500
Meloidogyne (Root Knot)	50	100	150
Other:			

Comments: + = Fungal Feeders, no threshold value assigned
 ++ = Non-pathogenic to turf plants
 +++ = Lesion often high in young plants due to small root mass concentrating them; but plants can outgrow feeding effects of lesion nematodes under this number.
 = Severely pathogenic nematodes

Threshold levels are those levels of nematodes that would reduce stand by 15%.