

# GENERALIZED CALENDAR OF EVENTS FOR INSECTS AND DISEASES IN WISCONSIN









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## SOYBEAN

### Generalized calendar of events for insects & related pests on WI soybean

Timings shown are approximate and may fluctuate according to location within the state. Degree Day accumulations and timing of insect migrations need to be monitored carefully. Narrow lines indicate that field damage is less likely to be detected.

	April	May	June	July	August	September
Seed corn maggots						
Slugs						
Bean leaf beetles						
Two-spotted spider mites						
Japanese beetle adults						
Soybean leaf defoliators						
Soybean aphids						

**Seedcorn maggots.** There are 4-5 generations/year, however, only the first and second adult flight periods (360 and 1080 DD, base 390 F) affect germinating soybeans. These flight periods are best monitored using degree days, not calendar dates. Consider using an insecticide seed treatment if soybeans are planted during peak adult flight.

**Slugs.** Slugs are active the entire growing season. However, the greatest risk to soybean is during the seedling stage. Fields with the greatest potential for damage have high amounts of crop residue on the surface, are wet for long periods of time and/or have heavy soils and heavy weed pressure. Economic threshold has been established for slugs.

**Bean leaf beetle adults.** Overwintering adults search for the earliest planted soybeans to feed. First and second generation adults can overlap. Second generation adults may be present up to senescence. The economic threshold is dependent on crop stage, control costs and selling price. Consult Erin Hodgson's (Iowa State University, Department of Entomology) bean leaf threshold which is published in A3646, *Pest Management in Wisconsin Field Crops*. Copies may be downloaded free or purchased from the UW's Pesticide Applicators Training Program's website:

[https://patstore.wisc.edu/secure/browse\\_cat.asp?category\\_id=39](https://patstore.wisc.edu/secure/browse_cat.asp?category_id=39)

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**Japanese beetles.** Adults feed on soybean foliage. Defoliation should be considered on a whole plant basis. Not just the upper leaves. The economic threshold for soybeans in the vegetative stages of development is 30% defoliation and 20% defoliation for reproductive stages.

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**Two-spotted spider mites.** Hot/dry weather, not degree days or time of year, will have the greatest influence on spider mite populations. Begin spot-checking soybean after 1 ½ weeks of unseasonably dry weather. Concentrate early scouting activities on field edges and/or drought stressed areas of fields. No specific economic threshold has been developed for two-spotted spider mites. However, treatment may be warranted if:

- Mites are present during R1-R5 stages of soybean
- 15% or more leaf area are discolored and stippled w/ leaves yellowing
- Live mites are present
- Hot, dry weather is expected to continue

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**Soybean leaf defoliators.** Several different insect species feed on soybean leaves including thistle caterpillars, grasshoppers, cutworm, green cloverworm, loopers, woolly bear caterpillars, etc. Scouting from emergence to senescence is recommended. Defoliation should be considered on a whole plant basis. Not just the upper leaves. The economic threshold for soybeans in the vegetative stages of development is 30% defoliation and 20% defoliation for reproductive stages.

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**Soybean aphids.** Soybean aphids may colonize soybean fields as early as late May. However, soybeans are at the greatest risk to aphid feeding from R1 to R5 (first flower to full pod). Consider treating soybean fields if 80% or more of the plants have 250 or more aphids/plant and only if that population has been increasing during recent field visits. A threshold for R6 soybeans has not been developed, however, it is significantly higher than the previously indicated threshold. Treating below-threshold populations is not advised. Yield loss is unlikely and natural enemies will be killed. This could lead to a resurgence in aphid populations and/or two-spotted spider mites. Especially if environmental conditions are conducive to mite buildup.



# Generalized calendar of events for common diseases in WI soybean

Timings shown when the disease is typically visible and are approximate, varying according to location within the state.



**Alfalfa mosaic.** Can be commonly observed in soybean stands, especially in close proximity to alfalfa fields. This disease cannot be managed in-season. Use certified seed to limit any seed transmission.

**Bacterial blight.** Caused by a bacterium, thus fungicides will not manage this disease. It commonly occurs in WI especially in fields with soybean residue or on short rotations. Choose cultivars with resistance to the disease.

**Bacterial pustule.** Not as common as bacterial blight, in WI. It is caused by a bacterium, thus fungicides will not manage this disease. Bacterial pustule is typically worse in fields with soybean residue or on short rotations. Choose cultivars with resistance to the disease.

**Bean pod mottle.** Caused by a virus. Fungicides are not effective on this disease. Bean leaf beetle is the primary vector of this virus. Planting soybeans later can help to reduce bean leaf beetle feed-

ing pressure. Managing bean leaf beetle is also recommended. See the bean leaf beetle section above for recommendations on managing this insect.

**Cercospora leaf blight and purple seed stain.** This disease can be commonly observed in Wisconsin, usually at levels that are not yield limiting. Resistance in commercial cultivars has been fairly good. Rotating to a crop other than soybean and managing soybean residue can reduce the severity of this disease. Fungicides are labeled for Cercospora leaf blight, however, typically not needed in WI due to the relatively low severity levels of this disease.

**Downy Mildew.** Can be observed when conditions are cool and wet. May be common in irrigated fields. Most modern soybean cultivars have excellent resistance to downy mildew. Rotating crops and burying residue are also recommended in fields where downy mildew has been a problem. Spraying fungicide for this disease is not recommended in WI.

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**Frogeye leaf spot.** This disease is inconsistent in appearance in Wisconsin. When it does show up, it is usually in the southern tier of counties or counties in the southwest portion of the state. It typically shows up late in the season and has minimal effect on yield in most years in WI. Choose varieties with resistance and manage soybean residue. Fungicides are labeled for this disease and should be applied between the R1 and R4 growth stages. Resistance to the QoI or strobilurin fungicides has been reported in the U.S. In most years there will not be a positive return on investment in WI, where fungicide is used to treat frogeye leaf spot.

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**Phomopsis seed decay.** Favored by warm wet weather during the late reproductive phases of the plant. Many cultivars have resistance to the disease. Managing residue and rotating crops can also help manage seed decay. Fungicide applications at the R5 growth stage may help improve seed quality in fields where this disease is a problem, but not increase yield. Seed treatment can help reduce stand losses due to seed transmission of fungus.

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**Phyllosticta leaf spot.** Generally, a minor disease of soybeans in Wisconsin. Spraying fungicide is not recommended for this disease, as it rarely reaches levels that limit yield. Use certified seed, while rotating crops and managing soybean residue.

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**Septoria brown spot.** This is the most common foliar disease of soybean in Wisconsin. It is favored by warm, rainy weather, but is commonly observed in most fields. Cultivars do vary in susceptibility to brown spot. Rotating and managing soybean residue can help limit the severity of this disease. Fungicides are labeled for managing this disease. Spraying during the R3-R5 growth stages is recommended. However, in Wisconsin, spraying for this disease often results in only a 1-2 bu/a gain in soybean yield.

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**Soybean dwarf.** Caused by a virus, thus fungicide applications are not recommended to manage this disease. Choose cultivars with resistance to the disease. Don't plant soybean next to clover, to help reduce the proximity to the primary inoculum source. Managing aphids, which are the primary vectors of the virus, may help reduce the incidence of soybean dwarf. See the section above on managing aphids in soybean.

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**Soybean mosaic.** Caused by a virus, thus fungicide applications are not recommended to manage this disease. Use certified seed to limit seed transmission. Plant on time, as later-planted stands can be at higher risk for soybean mosaic.

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**Soybean vein necrosis.** Caused by a virus, thus fungicide applications are not recommended to manage this disease. It is transmitted by several species of thrips, however thrips management is not recommended. Other management practices are not known to be effective for this disease.

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**Anthracnose stem blight.** Can be common in years where warm, wet weather prevails. Use high quality, certified seed. Rotate and manage soybean residue. Fungicides are labeled for control of anthracnose and can be applied between the R1-R4 growth stages. However, in most cases, application of fungicide for this disease alone will not be economical.

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**Brown stem rot.** Can be more severe in years that are cool and wet during the vegetative phases of soybean. Choose cultivars with resistance to the brown stem rot. Cultivars with the PI 88788 form of soybean cyst nematode resistance are generally resistant to brown stem rot. Rotate crops and manage soybean residue. Fungicide applications are not recommended for this disease.

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**Fusarium root rot and wilt.** Typically, more severe on young soybean plants. Choose varieties that are less susceptible to the disease. Avoid planting into cool /wet soils. Use a fungicide seed treatment to reduce disease severity and reduce stand loss.

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**Lesion nematode.** Very common in fields with corn/soy rotations. Manage plant stress from drought and break up soil hardpans. Rotating to a non-host can also help manage this nematode.

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**Phytophthora root and stem rot.** Can be problematic in fields that do not drain well. Use cultivars with the best resistance to the disease that you can find. In WI, the Rps1k gene has been effective in most fields. Rotating crops and improving drainage in the field is recommended. Using a fungicide seed treatment with a product specific to Phytophthora can be quite effective in fields with a history of the disease.

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**Pod and stem blight.** Can be common in some fields in WI. Choose cultivars with resistance to the disease. Use high-quality, certified seed. Manage soybean residue and rotate with non-host crops. Spraying fungicide at the R5 growth stage may protect seed quality, but not increase yield in fields with a history of this disease.

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**Pythium seedling blight and root rot.** Usually a problem early in the season when soils are saturated. In WI, damage is also favored by cool temperatures. Avoid planting into cool, wet soils. Use a fungicide seed treatment specific for Pythium in fields where the disease is a problem.

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**Rhizoctonia seedling blight and root rot.** Usually a problem early in the season, especially on soils that are sandy in composition. Use cultivars with resistance to this disease. A fungicide seed treatment is recommended in fields with a history of the disease.

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**Soybean cyst nematode (SCN).** SCN can be found in most soybean production areas of WI. Test your soil routinely and chart the populations of this nematode. Choose cultivars with resistance based on recommendations from the soil test. Rotate to non-host crops, manage weeds, and reduce plant stress. Nematicide seed treatments can also help reduce the severity of infection by SCN.

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**Stem canker.** Can be problematic in years when it is consistently wet. Use varieties with resistance. Manage residue and rotate to non-host crops. Fungicide applications are not recommended for this disease.

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**Sudden death syndrome (SDS).** Typically, a problem in years when it rains consistently after planting and turns dry during the reproductive growth stages. Can be common in fields where corn is rotated with soybean. Do not delay planting soybeans. Choose varieties with the best resistance rating you can find. Most fungicide seed treatments are not effective against SDS. However, several active ingredients have been shown to be effective, when SDS pressure is high. Consult with your local extension office for seed treatment recommendations.

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**White mold.** Typically, a problem when cool/wet conditions are common during the soybean flowering period (R1-R3)). Use cultivars with the best possible resistance you can find. Use no-till and small grains in rotation with soybean to reduce white mold pressure. Good weed management is also recommended. Foliar fungicides can be used to manage white mold. However, these fungicide applications must be made between the R1 and R3 to be effective. Several biological control agents are also available, that are applied to the soil. Consult your local extension office for specific recommendations.