Insect, Nematode, and Disease Control in Michigan Field Crops

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**This bulletin contains information on the management of field crops insects, nematodes, and diseases, including recommendations for pesticide use. Every attempt is made to verify product names, formulations, use rates, and other important information, but products and labels may change before the field season begins. Always read the label of a product to reconfirm rates, precautions, PPE, and other important information before use.

Hay and Pasture Insect Pests

Armyworm

Pest status: Rarely an economic pest in hay
Description: Caterpillars variable in color (black/brown/green). Narrow light stripe across back and broad stripes running down sides of body.
Life cycle: Probably migrate to Michigan each spring. 2-3 generations per year.
Type of damage: Defoliation by larvae.
Threshold: Treat when there are 6 or more armyworms per sq ft.

List of Registered Insecticides (rate per acre, *RUP):

Biobit HP (0.5 to 2.0 lb)
Carbaryl 4L (2 to 3 pts)
Dipel DF (1 to 2 lb) or ES (2.0 to 4.0 pt)
Lannate LV* (0.75 to 3 pts) or SP* (0.25 to 1lb.)
Lepinox WDG (1 to 2 lb)
Malathion 5 (2 to 2.25 pts) or 8 Aquamul (1.25 pt)
Pyganic EC 1.4 II (16 to 64 oz, **Grasses only**)
Pyganic EC 5.0 II (4.5 to 18 oz, **Grasses only**)
Sevin 4F or XLR Plus (1 to 1.5 qt)
Sevin 80S or 80WSP (1.25 to 1.875 lb)

European skipper

Pest status: Introduced into North America in 1910. Rarely an economic pest in hay
Description: Adult is pumpkin orange, resembles a butterfly. Larvae are small, greenish caterpillars up to ¾ inch in length.
Life cycle: Eggs hatch in late April. Larvae feed until mid-June, then pupate. Adults emerge in late June to early July. One generation per year.
Type of damage: Larvae feed on grass blades, gouging, rolling and stripping the leaves. Prefers timothy.
Sampling: Cut several square-foot samples of forage down to the ground and place in bags. Leave overnight. Larvae will crawl out of grass to be counted the following day.
Threshold: Treat when there are 6 larvae per sq ft. For best protection, treat when the larvae are small (less than about 3/8 in long). Use higher rates for larger (greater than 1/2 inch long) larvae.

List of Registered Insecticides (rate per acre):

Biobit HP (0.5 to 1.0 lb)
Condor (0.67 to 1.67 qt)
Crymax (0.5 to 2 lbs)
Dipel DF (0.5 to 1.0 lb) or ES (1 to 2 pt)
Lepinox WDG (1 to 2 lb)
Sevin 4F or XLR Plus (1 to 1.5 qt)
Sevin 80S or 80WSP (1.25 to 1.875 lb)

Grasshoppers

Pest status: Common insect**.** Occasional outbreaks.
Life cycle: Eggs overwinter in soil; nymphs hatch in June. As nymphs grow, feeding damage increases. Females lay eggs in soil in late summer.
Type of damage: Defoliation by nymphs and adults.
Conditions favoring damage: Unplowed or fallow areas, such as hay fields and pastures, are preferred egg-laying sites. Dry, warm weather enhances nymph survival.
Management: Biological - A fungal pathogen kills many eggs and nymphs under wet spring conditions. Natural enemies (birds, rodents, amphibians) also feed on grasshoppers, but may not keep up during outbreaks.
Threshold: Treat when there are eight grasshoppers or more per sq yard in hay less than 6 in tall, or 16 or more per sq yard in taller hay.
Note: In outbreak years, grasshoppers produced in hay fields and pastures may move into neighboring crops.

List of Registered Insecticides (rate per acre):

Carbaryl 4L (1 to 3 pts)
Fyfanon (1.5 to 2 pt) or ULV (8 to 12 fl oz)
Malathion 5 (1.5 to 2 pt) or 8 Aquamul (1.25 pt) or 8F (1 to 1.25 pts)
Malathion ULV (8 to 12 fl oz)
Sevin 4F or XLR Plus (0.5 to 1.5 qt)
Sevin 80S or 80WSP (0.63 to 1.875 lb)

Insecticides Registered for Hay and Pasture

Trade name	Common name	Class	Recommended for:	PHI days	REI hrs	Precautions and Remarks
Bt [Biobit HP, Condor, Crymax, Dipel DF/ ES, Lepinox WDG]	*Bacillus thuringien-sis*	Bio	Armyworm, Skippers	0	4	Bt is a biological insecticide produced from the bacterium *Bacillus thuringiensis*. Effective only against early-stage larvae. Recommended when honeybees may be exposed.
Carbaryl 4L	carbaryl	Carb	Armyworm, Grasshoppers, Skippers	14	12	Do not apply if honeybees are foraging in the field. Maximum 2 applications per season.
Fyfanon	malathion	OP	Grasshoppers	0	12	
Lannate **(RUP)** LV & SP	methomyl	Carb	Armyworm	7	48	
Malathion 5, 8 Aquamul, 8F, ULV	malathion	OP	Armyworm, Grasshoppers	0	12	
Pyganic EC	pyrethrum	Bio	Armyworm	0	12	Use on grasses only. Listed by the Organic Materials Review Institute (OMRI) for use in organic production.
Sevin 4F, XLR Plus, 80S, 80WSP	carbaryl	Carb	Armyworm, Grasshoppers, Skippers	14	12	Do not apply if honeybees are foraging in the field. Maximum 2 applications per season.