$$\% \text{ Mortality} = 100 \times (1 - (1 \div (SR \times RC)^{GT})).$$

*Pest**	*Reproductive Capacity*	*Generation Time*	*% Mortality*
Pecan weevil	75 eggs/female	.33 or .50 gen/yr	30 – 53/season**
Pecan nut casebearer	50-150 eggs/female	2 gen/yr	99-99.9/season
Hickory shuckworm	unknown	2-5 gen/yr	unknown
Black pecan aphid	35 nymphs/female	26 gen/yr	99.9/season
Yellow pecan aphid	38 nymphs/female	32 gen/yr	99.9/season
Black margined aphid	125 nymphs/female	16 gen/yr	99.9/season
Pecan leaf scorch mite	9-36 eggs/female	7-8 gen/yr	99.9/season
Fall webworm	300-1000 eggs/female	4 gen/yr***	98-99.9/season
Walnut caterpillar	120-880 eggs/female	2 gen/yr	99-99.9/season

* Kernel feeding hemipterans are not listed since they invade the orchard and do not breed in the orchard.

** 97.3 % mortality per generation is required to prevent pecan weevils from increasing in the orchard. 30 % (53%) mortality per year will control weevils with a 3 (2) year life cycle.

*** 2 overlapping broods occur each season.

Table 2. Control methods for the eight major pecan arthropod pests in North America.

Pest	*Control method for pest*	*Relative efficacy*
Pecan weevil *Curculio caryae* (Horn)	Broad spectrum insecticides Quarantine Risk rating and spot treatment Trunk treatment Red imported fire ant as predator	High High Moderate Moderate Low
Pecan nut casebearer *Acrobasis nuxvorella* (Neunzig)	Broad spectrum insecticides Biorational insecticides Mating disruption	High High Low
Hickory shuckworm *Cydia caryana* Fitch	Broad spectrum insecticides Biorational insecticides Sanitation	High High Moderate
Black pecan aphid *Melanocallis caryaefoliella* Davis	Organophosphate insecticides Neonicotinoid insecticides Insecticidal soap *Harmonia axyridis* (Pallas) Interplanting crape myrtles	High Moderate High Moderate Low
Yellow pecan aphid *Monelliopsis pecanis* Bissell	Soil applied systemic insecticides Neonicotinoid insecticides Insecticidal soap *Harmonia axyridis* (Pallas) Introduced parasites	High High High Low Low
Blackmargined aphid	Soil applied systemic insecticides	High

Monellia caryella Fitch	Neonicotinoid insecticides Insecticidal soap *Harmonia axyridis* (Pallas) Introduced parasites	High High Low Low
Pecan leaf scorch mite *Eotetranychus hicoriae* (McGregor)	Miticides Sulphur Predatory mite release Dormant oil sprays	High High Moderate Low
Kernel-feeding Hemipterans - Pentatomidae and Coriedae	Pyrethroids Broad spectrum insecticides Trap crops Removing alternate host plants	High Moderate Low Low

* Control methods listed in the table have shown benefits greater than the costs.

** Efficacy ratings: Total = 100%; High - 96% to 99%; Moderate – 80 to 95%; and, Low < 80%.