Title Insect population dynamics in commercial grain elevators

Author P.W. Flinn, D.W. Hagstrum, C. Reed andT.W. Phillips

Citation Journal of Stored Products Research,Volume 46, Issue 1, January 2010, Pages 43-47

Keywords *Rhyzopertha dominica*; *Cryptolestes ferrugineus*; *Tribolium castaneum*; Integrated pest management; Stored grain

Abstract

Data were collected in 1998–2002 from wheat stored in commercial grain elevators in south-central Kansas. Bins at these elevators had concrete walls and were typically 6–9 m in diameter and 30–35 m tall. A vacuum-probe sampler was used to collect grain samples in the top 12 m of the wheat in each bin. The primary insect species found in the wheat samples were: *Cryptolestes ferrugineus*, *Rhyzopertha dominica*, and *Tribolium castaneum*. In the top 3.7 m of grain, *R. dominica*, *C. ferrugineus*, *T. castaneum* and *Sitophilus oryzae* made up 44, 36, 19 and 1% of the insects found in the samples, respectively. From 3.8 to 12.2 m, *R. dominica*, *C. ferrugineus*, *T. castaneum* and *S. oryzae* were present at 84, 8, 8, and 1%, respectively. The most prevalent species also changed over time. In June, the start of wheat harvesting and storage in Kansas, insect density was low in the bins. At this time, *C. ferrugineus* was the most common insect, and it was found mostly in the top grain sample (0–1.2 m). In September through November, *C. ferrugineus* and *R. dominica* were at similar densities; however, from February to March, *R. dominica* was more common.

Generally, insect density was greatest at the top and decreased with grain depth. Very few insects were found in samples collected from greater than 12 m (most of the bins contained grain to depths of 24–36 m). Insect density for all species increased rapidly from June through October. During this period less than 20% of the bins had economically significant insect densities (>2 insects/kg). From October until February, the average insect density remained fairly constant but it was greatly reduced in April, May, and June. Bins that had insect densities >2 insects/kg tended to be located adjacent to other heavily infested bins.