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PHOSPHINE RESISTANCE ON BRAZILIAN STRAINS OF *Rhyzopertha dominica* (F.) (COLEOPTERA: BOSTRYCHIDAE)

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Managing pests of stored grain has become an increasingly serious problem in Brazil. This is because grain production has more than doubled in the last 10 years and insect pests have become resistant to protectant insecticides. In the same period, use of phosphine fumigation has increased rapidly and is now widely practised. However, control failures with phosphine have become common as fumigations are undertaken in unsealed silos and in situations where sanitation is poor. As a consequence, many parcels of grain are repeatedly fumigated. With the aim of investigating the extent of phosphine resistance on Brazilian strains of *Rhyzopertha dominica* and the time of population extinction, experiments were carried out at the DPI&F Indooroopilly, Queensland, Australia with 19 Brazilian and three local strains. The strains were tested for their susceptibility to phosphine and segregated in susceptible, weak resistance and strong resistance. After each strain was characterized in 48 h fumigation bioassays determining the regression lines and the resistant factors. Mixed-age cultures containing all life stages of two strong resistant strains and a susceptible strain were set-up exposing them to a series of fixed concentrations of phosphine at a range of exposure periods. The results showed high levels of resistance to phosphine in the Brazilian strains with 74% strong resistant, 26% weak resistant and no susceptible strains. The resistant factor between resistant and susceptible strains ranged from 3 to 549 times showing the very high level of resistance to phosphine. With 4 days at 1.0 mg/litre it is possible to eliminate all life stages of the strong resistant BR33 strain, but not at 2.0 mg/litre, which requires more than 6 days. Phosphine fumigation in Brazil needs an urgent change to prevent the increase of pest resistance and consequently losses in food quality

Key words: *Rhyzopertha dominica*, phosphine, grain