

Peanut Kernel Shivel – An Undiagnosed Condition of Peanut Crops in Queensland, Australia

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Peanut Kernel Shivel (PKS) is a currently undiagnosed condition affecting peanut crops growing in Queensland, Australia, particularly in the Bundaberg region in SE Queensland, where peanuts are grown in rotation with sugarcane. PKS is a condition where kernels in some, or all, pods on a plant approaching maturity, cease normal development and fail to reach their full size. This results in shriveled testa, low kernel % and high shell %, which reduces overall crop yield, quality/grading and price/Mt of farmer stock. In more mature kernels, the testa appears to die off, presumably due to a lack of assimilate from the plant, and develops a brown/light tan colour. The 'funiculus' which feeds assimilates from the plant/pod to the developing kernel often appears swollen, darkened, fibrous and prominent compared to its smaller nearly transparent appearance in normal developing kernels. The swollen and unusual funiculus appears to result from some sort of 'physiological blocking' of assimilate flow from the plant to the developing testa/kernel. There are no other obvious symptoms on the vegetative growth of plants which appears quite normal, with the main quality constraint associated with PKS remaining undetected until harvest. The condition has caused yield and quality impacts since 2012, and reduced grower returns by up to A\$500-\$1000 per ha, and cost industry more than A\$2.5M p.a. since this time. Initial detailed investigations showed no evidence of biotic or abiotic causes, including water quality, nutrition, subsoil constraints, insects, nematodes and viruses. Interestingly, large genotypic differences in PKS incidence and damage have however been observed, with some lines only suffering minor PKS effects. All of the currently grown commercial varieties are however susceptible to PKS. More recent research in 2017/18 has narrowed down the possible causes of PKS to an insect vectored *Phytoplasma* and/or fungi *Fusarium oxysporum*. An update on this research will be presented.