

**WEEDING AND MULCHING FOR MANAGEMENT OF APHIDS AND ASSOCIATED
VIRAL DISEASES OF PASSION FRUIT IN UGANDA**

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ABSTRACT

Passion fruit is doubtless an important crop whose production has the potential to alleviate poverty in rural households. Additional significance is packed in its nutritional, confectionary and medicinal properties. It is a source of income to the farmers that grow it. Despite its value, production is hampered by challenges of which biotic and management-related problems are outstanding as revealed by previous studies. However the damage due to biotic factors especially virus infections is the most menacing. Virus infections cause yield loss of 40 to 100% depending on severity. They reduce the longevity of the plant from 5 years to 1 year. Previous investigations identified and characterized the causative agent of the viral diseases, implicating the vectors concerned. Unfortunately, all passion fruit varieties on the Ugandan market are susceptible to the viruses. The scanty information on the current passion fruit production environment, farmers' knowledge and perceptions of the viral infections, and present virus management strategies led to the initiation of this study in Uganda. It aimed to supplement information that would assist in packaging of cultural practices for management of aphid vectors and associated viruses of passion fruit in Uganda.

A survey was conducted in Buikwe and Mubende districts, central Uganda in 2011. Farmers' knowledge of passion fruit viruses and their management were assessed using structured questionnaires and interviews. The survey revealed that majority (80%) of the farmers acknowledged passion fruit virus diseases as a key production limitation. Seventy three percent (73%) of the farmers recognized the diseases by symptom description. Unfortunately, only a minority (5%) of farmers who claimed to be aware of the disease cause, attributed them to use of virus-infected planting materials. Thirty two percent (32%) considered the cause to be direct insect feeding damage. None of the farmers pinpointed the pathogen to be virus/es. Nearly all the farmers lacked knowledge of passion fruit virus diseases transmission. Pesticide application was the key disease management strategy. Although this successfully killed off some insects, the lack of knowledge on target vectors led to limited effect in reducing disease incidence. Farmers were willing to adopt weeding and mulching as potential viral disease management strategies if proven to be effective.

Subsequently, an investigation was carried out at Sendusu, IITA from January 2013 to April 2014. It determined the effect of weeding and mulching on passion fruit aphid vectors and

associated viruses through a randomized complete block design experiment with three replications. Kawanda hybrid passion fruit were subjected to four treatments including straw mulch, plastic mulch, weeding and no weeding for two seasons. Mulching performed better than weeding in terms of reducing virus disease incidence and boosting of yield. Straw mulch significantly ($P \leq 0.05$) minimized virus disease incidence (45%) and had the highest significant yield overall (0.2Kg) per plant, as compared to other treatments. Plastic mulch produced significantly the longest (107cm) passion fruit vines. Aphid counts in the different treatments were not statistically different though they varied significantly over time. Straw mulch has potential as a management strategy and gave the highest returns per year (Ug. Shs. 4,704,620=), compared to other treatments. Its adoption however would require further studies on integration in various cropping systems considering that most farmers intercrop passion fruit. The basic information generated on farmers' knowledge of viruses, current production systems and importance of weeding in viral disease management will assist in development of an Integrated Pest and Disease Management package for passion fruit viral diseases and associated aphid vectors in Uganda.