



## Impact of Groundnut Bud Necrosis Virus on Peanut Yield and Quality

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### Description

Groundnut Bud Necrosis Virus (GBNV) is one of the most significant viral threats to peanut (*Arachis hypogaea*) production, particularly in Asia and Africa. The virus is a member of the *Tospovirus* genus and is transmitted by thrips, primarily *Thrips palmi* and *Frankliniella schultzei*. GBNV causes Groundnut Bud Necrosis Disease (GBND), which can lead to severe yield losses and a reduction in the quality of peanut crops. This discuss the impact of GBNV on peanut yield and quality, examining the symptoms, mechanisms of yield loss and the broader economic implications for peanut farmers and the agricultural sector.

Early symptoms of GBNV infection typically appear as chlorotic (yellow) spots or rings on young leaves, often accompanied by vein clearing. As the disease progresses, these chlorotic areas may turn necrotic, leading to browning and death of the affected tissue. Infected plants may also exhibit stunted growth, distortion of leaves and a reduction in leaf size. One of the characteristic symptoms of GBNV is bud necrosis, where the growing tips (buds) of the plant become necrotic and die. This symptom is particularly detrimental as it directly affects the plant's ability to produce flowers and subsequently pods, leading to significant yield losses. In severe cases, the virus can spread systemically throughout the plant, causing a general wilting and dieback of the entire plant.

Infected plants may also exhibit stem necrosis and blackening of the petioles, further compromising their health and productivity. The necrosis of buds caused by GBNV directly reduces the number of flowers produced by the plant. Since flowers are precursors to pod formation, a reduction in flowering leads to fewer pods and a

corresponding decrease in yield. This is one of the most direct and significant ways in which GBNV impacts peanut production. In regions where peanuts are a major export commodity, GBNV can have a significant impact on trade. Exporters may face reduced volumes of high-quality peanuts available for sale, leading to a loss of revenue. Additionally, the presence of aflatoxins in peanuts can result in trade restrictions or bans, further affecting the profitability of peanut exports. In many developing countries, peanuts are an important source of nutrition, providing protein, oil and other essential nutrients.

The yield and quality losses caused by GBNV can reduce the availability of this important food source, potentially affecting food security in vulnerable communities. Moreover, the economic losses sustained by farmers can exacerbate poverty and reduce access to essential resources. Given the significant impact of GBNV on peanut yield and quality, effective management strategies are essential to moderate the disease's effects. Breeding and promoting the use of GBNV-resistant peanut varieties is one of the most effective strategies for managing the disease. Resistant varieties can reduce the incidence of GBNV and limit yield losses, providing a sustainable solution for farmers in affected regions. Controlling the thrips vectors of GBNV is perilous in preventing the spread of the virus. Integrated Pest Management (IPM) strategies, including the use of insecticides, cultural practices and biological control agents, can help reduce thrips populations and minimize GBNV transmission.

Implementing cultural practices such as crop rotation, proper field sanitation and timely planting can reduce the incidence of GBNV. These practices can help break the disease cycle and reduce the chances of infection in subsequent crops. Educating farmers about the symptoms of GBNV, the importance of early detection and the best management practices is essential for controlling the disease. Extension services can play a key role in disseminating knowledge and providing support to farmers in implementing effective disease management strategies. GBNV has a reflective impact on peanut yield and quality, leading to significant economic losses for farmers and affecting the overall productivity of peanut crops. The disease's effects on flowering, pod formation, kernel quality and susceptibility to aflatoxin contamination pose serious challenges to peanut production. Effective management strategies, including the use of resistant varieties, vector control and cultural practices, are essential to moderate the impact of GBNV and ensure the sustainability of peanut farming in affected regions. Continued research and investment in disease management are essential to protecting this vital crop and supporting the livelihoods of farmers worldwide.

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