Soybean mosaic virus
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_Soybean mosaic virus_ (SMV) occurs in all soybean production areas of the world. Yield loss ranges from 8 to 35% with a high of 94% in some production systems. Though symptoms can vary among soybean varieties, a green/yellow mosaic pattern is the most common (Fig. 1). At advanced stages a yellow/brown mosaic pattern is often observed, many times followed by premature defoliation (Fig. 2). Infected seeds are mottled brown or black; however other diseases may cause seed discoloration thus a laboratory assay is necessary to verify SMV infection. Yield and quality losses are related to smaller seed size, with lower germination rate than healthy seeds. The yield losses caused by SMV infection in Arkansas have not been thoroughly documented.

![Mosaic pattern on infected soybean](image)

**Figure 1.** Mosaic pattern on infected soybean. (Photo credit: Zhou, J)

SMV may be introduced into a virus-free region by planting infected seed. The pathogen is spread from plant to plant by aphids. The soybean aphid, _Aphis glycines_, the most common SMV vector, is the only aphid species that can establish colonies on soybean. Once an aphid feeds on an infected soybean plant, it only takes a short time (seconds to a few minutes) for the insect to acquire the virus. As the virus-carrying aphids move and feed on healthy plants, the virus will be spread around. In the absence of soybean the virus can overwinter on a wide range of hosts from five plant families (Bean, Amaranth, Passion - flower, Figwort and Nightshade). The ability of the soybean aphid to overwinter in Arkansas and alternative host species of importance for SMV in Arkansas are not known. Chemical control of the soybean aphids is not
recommended because some insecticides may increase the movement of the vector in the field, which facilitates further dissemination of the virus.

It is important to use virus-tested seeds to minimize incidence of this disease. Resistant cultivars have been widely used, and planting SMV-resistant soybean cultivars is the most economical practice to manage the disease. Several resistance genes have been identified and are effective against some, but not all, virus strains. Based on the differential reactions on a set of soybean cultivars, SMV has been classified into numerous strains. In the U.S, nine strains G1-G7, G7a and C14 are currently recognized. Additional strains have been identified in other countries (Canada, China, Japan and South Korea) including isolates that overcome all known resistance to the virus. In Arkansas, only high yielding cultivars with resistance to most (or all) SMV strains, such as Ozark, USG 5002T and USG 5601T are widely used in controlling SMV. An additional management tactic is avoiding late planting to minimize aphid transmission at an early crop growth stage.