

## Abstract

Production of common bean in Kenya is constrained by pests and diseases and to improve bean yields amongst majority small-scale farmers, appropriate management strategies should be adopted. Bean common mosaic disease (BCMD) caused by bean common mosaic virus and vectored by bean aphids and infected seeds, substantially inhibit common bean production in Kenya. An extensive and diagnostic field survey was conducted in six agro ecological zones (AEZs) of lower eastern Kenya during the long and short rains of 2018 to determine BCMD incidence (BCMD-I), severity (BCMD-S), bean aphid abundance (BAA), bean aphid incidence (BAI) and the management strategies applied by farmers. Significant ( $P \leq 0.001$ ) variations observed for these traits between bean varieties, rainy seasons and AEZs implied that farmers could select and grow a tolerant bean variety or grow a variety either in a season or an AEZ with low BCMD and bean aphid pressure. Such included AEZ-UMSA with least mean BCMD-I (42%), BCMD-S (1.9) and BAI (11%) compared to two AEZs (LHSH & LM4) that showed BCMD-I of >70%, BCMD-S >3.0 and BAI >50%. The AEZs differences could be attributed to variations in altitudes, temperature and humidity that influences vector (aphid) movement. Of the nine bean varieties identified during the survey, Selian 14 was the most preferred by farmers (at ~35%) with relatively lower BCMD-I (~49%) and BAI (~35%) compared to the least (75% of farmers could generally identify diseased or pest-infested bean crops and stage of growth of the crop most affected. None (0%) could however identify BCMD symptoms although ~40% identified the vector bean aphids with ~26% implementing some form of aphid or pest management strategy. On management, season-driven early planting and bean intercropping were the most applied strategies (>80%), crop rotation and weed control accounted for ~71%, certified seeds at 1% and non-chemical or pesticide applications (0%). Both low adoption of certified seeds and no chemical aphid control were attributed to high costs, despite the possibility the two factors could have contributed to higher incidences and severity of BCMD in the study area as the disease is both seed and vector-borne. In summary, lack of knowledge and training among farmers on diagnosis and management of aphid-pests and BCMD, were cited as the main constraints for low bean cultivation. This study therefore recommends provision of adequate extension services and farmer training in lower eastern Kenya for improved bean yield and subsequent better family livelihoods and income.