GENERAL ABSTRACT

Farmer saved seed consists of inappropriate varieties, infected seeds of poor germination potential resulting in low seedling vigor, crop stand and high incidence of diseases leading to poor yield. The study was conducted to determine the quality of farmer-saved maize seeds in Busia County of western Kenya and the effect of seed quality on crop performance. A survey was conducted in two agro-ecological zones using a structured questionnaire to obtain information on sources of maize seed, production practices, awareness, constraint and availability of improved maize seeds. Maize seed samples were collected from farmers, local market, Agro vet shops and major seed distributors. The seed samples were analyzed for physical purity, germination, vigor, and infection with fungal seed-borne pathogens. The collected seeds were used for field evaluation trials at Busia and Kakamega Counties. The experiment was laid out in a randomized complete block design with three replicates. Data were collected on 50% emergence, plant and cob height, off types, ear aspect and abnormalities, the incidence of seedling blight and viral disease, incidence and severity of fungal diseases, yield and yield components. Data were subjected to analysis using SPSS and GenStat 15th Edition.

About 50% of smallholder farmers used own recycled maize seed from the previous season while other sources of seed are local markets, agro vet shops, government, and friends. Majority of the farmers are aware of improved maize varieties but the use of certified maize seed is low due to high cost. Armyworms and Striga were the major pests threatening maize production in the region but few farmers can afford chemical pesticides. Ear rot was reported as a major disease affecting maize and grain yield ranged between 200 and 600 kg per hectare. The maize seed samples from all the sources did not meet the Kenyan recommended purity threshold of 99% but seed from Distributors and Agro vet shops had high levels of purity. Farmer saved and local market seeds had a poor physical purity which was below 70%. However, the seed samples had good germination and met the recommended standard of 90%. Farmer saved seed had the highest infection with 70.9% found to be contaminated. Fusarium sp was the common pathogen isolated from all sources. Others were Aspergillus sp, Penicillium sp.

Local market seeds had the highest field establishment. Farmer saved seeds had the highest number of off-type crops. Local market and farmer saved seeds had greater plant and cob height. There was no variation in root lodging between seed sources while farmer saved and local market seeds were highly susceptible to stalk lodging. Ear abnormalities were high in farmer saved and local market seeds which showed high incidence and severity of common diseases including northern leaf blight, gray leaf spot, Diplodia, rust, Brown spot, downy mildew and eyespot. Incidence and severity score of ear rot were high observed in farmer saved and local market seeds. However, agro vet seeds had the lowest incidence and severity of fungal diseases and performed with the highest yield depending on the variety.

Farmer saved seed is the predominant source of maize planting material but this seed is of inferior quality. Though informal seeds had high plant establishment, they were no true to their types, highly sensitive to lodging and infected by diseases. The certified maize seeds from agro vet shops were resistant to major diseases compared to the uncertified seeds and gave high grain yield. Farmers’ groups are heterogeneous differing in their preferences and priorities that should be considered in plant improvement programs. Farmers should be encouraged to use certified or
improved varieties to enhance crop productivity. Farmers and Agro dealers should be trained and sensitized on the importance of using improved seeds by or through demonstration plots and open field days.

**Keywords:** Certified Seeds, Farmer saved seeds, Maize, Seed quality, Seed system