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EVALUATION OF SELECTED COWPEA (*Vigna unguiculata* L.Walp) GENOTYPES FOR RESISTANCE TO COWPEA APHID-BORNE MOSAIC VIRUS DISEASE

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Introduction



- Cowpea is one of the most important and versatile nutritive grain legume crop native to Africa (Fransico *et al.*, 2014).
- Major source of dietary protein for hundreds of millions of people in Africa and Asia.
- World cowpea output stood at approximately seven million tonnes harvested from about 12.3 million hectares (FAO,2016).
- In sub Sahara Africa cowpea yield is been constraints by some virus such as *Cowpea aphid-borne mosaic virus* (CABMV) (Alegbejo, 2015).

Objectives



The objectives were to determine the:

- incidence and severity of *Cowpea aphid-borne mosaic virus* infection on the selected genotypes.
- growth and yield parameters of the genotypes under *Cowpea aphid-borne mosaic virus* infection

Methodology



- The study was carried out under screenhouse condition at the Teaching and Research farm, Federal University of Technology, Minna, Niger State. Two trials were established simultaneously.
- The experiment was laid out in Completely Randomised Design (CRD) with three replications.
- Seedlings were mechanically inoculated with virus extract at 10 days after sowing.
- 24 cowpea genotypes : Ife-Brown, TVU408, 06K-180-11, 07K-210-1-1, 09K-456, 10K-816-1, 10K-816-3, 12K-487, 12K-489, 12K-612, 98K-1092-1, 99K-573-2-1, 11D-24-25, 11D-24-29, 11D 24 40, IT11D-21-143, IT08K-150-11, IT09K-269-1, IT10K-817-1, IT10K-817-7, IT10K-821-6, IT12K-420, IT12K-425 and IT12K-488 constituted the treatments.

Experimental Setting



- Disease incidence (%): Percentage of the plants showing symptoms after inoculation.
- . A 5-point scale (Ayeleke *et al.*, 2016) was used for assessing the disease severity.
- The growth (number of days to flowering) and yield (number of pods per plant, pod length and seeds per pod) parameters were also recorded.
- Data were subjected to Analysis of variance (ANOVA) at $p < 0.05$ using Statistical Analysis System (SAS, 2008).
- The differences in growth and yield of the cowpea genotypes were separated using Duncan Multiple Range Test (DMRT) at 5 % probability level

Results and Discussion



- All the cowpea genotypes infected with CABMV showed mosaic, vein yellowing and leaf deformation symptoms.
- Disease incidence varied from 11.1 to 100 % at 3 weeks after inoculation.(WAI).
- The cowpea genotypes: 11D-24-25 (symptom score = 1.3), 99K-573-2-1 (symptom score = 2) and IT12K-425 (symptom score = 2) exhibited the mildest disease severity.
- The cowpea genotype IT12K-425 combined low symptom expression with the highest seed production (9 seeds per pod)
- The genotype IT12K-488 also combined high pod (3 pods per plant) and seed (10 seeds per pod) production attributes.

Results and Discussion



- The observation that all the inoculated plants exhibited typical symptoms of CABMV disease implies that none of them was immune to the virus.
- The cowpea genotypes 12K-632, 99K-573-2-1, 11D-24-25 and IT12K-425 which exhibited consistently lowest disease severity ratings could be described as the most tolerant.
- Disease severity increased in some infected cowpea genotypes at 5 WAI, confirming the fact that some viruses have the capacity to escape plant's defense barriers.
- The differences in growth and yield of the cowpea genotypes could be attributed to their inherent genetic background and partly due to deleterious effect of CABMV infection.



Conclusions & Recommendations



- CABMV disease incidence and severity were genotype dependent.
- The twenty four cowpea genotypes evaluated were susceptible to CABMV.
- The cowpea genotype IT12K-425 combined low symptom expression with the highest seed production.
- However, the genotype IT12K-488 also exhibited combined high pod and seed production attributes.
- Therefore, IT12K-425 and IT12K-488 which were the most promising under CABMV infection are recommended to farmers in order to enhance food and nutrition security.

References



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