

Characterization of amaranth germplasm in response to bacterial wilt disease caused by *Ralstonia solanacearum*

Honfoga, J¹; Azoma, K¹; Afari-Sefa, V¹; Sikirou, R.; Dossoumou, M.-E.E.A.; Zocli, B.; Paret, M.L.; Legesse, W¹.

¹World Vegetable Center

Amaranth is one of the most produced and consumed Traditional African Vegetables (TLVs) in sub-Saharan Africa. It is consumed for both leaves and seeds. Increasing consumption and production of Amaranths species make its production falling unto many diseases' attacks from which the bacterial wilt caused by *Ralstonia solanacearum* is becoming important and is causing a lot of yield losing to farmers. Therefore, there is a need to select resistant lines to manage bacterial wilt in the infested areas. This study aims to characterize 10 amaranth lines and identify stable sources of resistance to the disease. The experiments were conducted both in open field and under greenhouse condition. A Randomized Complete Block Design with three replications and ten treatments (amaranth lines such as Madiira 1, Madiira 2, BRESIL (B)-Sel, AC-LN, A 2002, AM-NKGN, GARE ES13-7, IP-5-Sel, UG-AMES13-2, Benin local variety) were used for both field and greenhouse experiments. For a good assessment of the germplasm behavior, we included the harvest parameter (cut and uncut plant) to observe its influence on the plant infection level. In field trials, the amaranth lines showed that the disease severity increased in the time for both cut and uncut plants, but the high levels of attack were observed on cut plants. AM-NKGN, UG-AMES13-2, Madiira 2 and the local variety showed the low severity mean (range 1), for uncut plants while for cut plants, only UG-AMES13-2 and the local variety were classified in this severity mean. AC-LN and IP5-Sel lines when cut or uncut, presented the high severity mean (range 4 and 5). From the whole lines tested, AC-LN and IP-5-Sel was the most susceptible showing between 70 and 95% of plant wilted for both cut and uncut plants. UG-AMES13-2, AM-NKGN and the local variety are the most resistant lines with 0, 5.13 and 6.41 % of wilted uncut plants and 5.13, 21.79 and 12.82 % of wilted cut plant. The greenhouse results showed that IP-5 Sel, AC-LN, A2002, Madiira 1, Bresil (B) Sel are most susceptible with 20 to 26.67% Bacterial Wilt Index (BWI) and a Bacterial Colonization Index (BCI) flicking between 26,67 et 80%, while AM-NKGN, GARE-ES 13-7, UG-AMES 13-2, Benin-local-variety and Madiira 2 are tolerant to the bacterium presence with a BWI between 0 et 13.33% and BCI between 6.67 et 33%. From the present study, three lines (UG-AMES13-2, AM-NKGN and Benin local variety) have been selected and can be proposed to the farmers in the infected areas to easily manage bacterial wilt. Those lines can also be used by breeders in future breeding programs.

Keywords: Characterization, Amaranth, *Ralstonia solanacearum*, germplasm, susceptible, resistant, tolerant