

RESEARCH ARTICLE

Integrated management of common bacterial blight (*Xanthomonas campestris* pv. *phaseoli*) and its effect on seed yield of common bean (*Phaseolus vulgaris* L.)

Sintayehu Fetene and Amare Ayalew

¹Plant science Course team, Madawalabu University, Bale-Robe, Ethiopia

Email: fetene2011@gmail.com, Mobile: +251 912 431189, P. Box 247 Bale Robe

Manuscript details:

Received: 21.07.2016
Accepted: 18.08.2016
Published : 08.10.2016

Editor: Dr. Arvind Chavhan

Cite this article as:

Sintayehu Fetene and, Amare Ayalew (2016) Integrated management of common bacterial blight (*Xanthomonas campestris* pv. *phaseoli*) and its effect on seed yield of common bean (*Phaseolus vulgaris* L.), *International J. of Life Sciences*, 4 (3): 336-348.

Copyright: © 2016 | Author(s), This is an open access article under the terms of the Creative Commons Attribution-Non-Commercial - No Derivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

ABSTRACT

Common bacterial blight (CBB) caused by the bacterium *Xanthomonas campestris* pv. *phaseoli* is a major disease of common bean affecting its production in eastern Hararghe, Ethiopia. The objectives of this study were to determine the integrated effect of seed treatment, biofumigation and foliar applications of chemicals on disease development, seed yield and yield components. Field experiments were conducted at Haramaya and Hirna experimental stations in 2010 main cropping season using a susceptible (Mexican-142) white pea bean cultivar. Seed treatment using streptomycin was integrated with biofumigation and foliar sprays of Kocide-101 at the rate of 2.31kg ha⁻¹ at two and four weeks intervals. The experiment was arranged in 2 x 2 x 3 factorial combination in randomized complete block design with three replications. A total of 12 treatments were evaluated. The data obtained indicated that the effects of seed treatment integrated with biofumigation and fortnightly foliar sprays were significant in reducing CBB epidemics, increasing yield, yield components and net benefits as compared with other treatment combinations at both locations. This was followed by integrations of seed treatment and biofumigation combined with foliar sprays at four weeks interval. Seed treatment integrated with biofumigation and foliar sprays at two weeks interval reduced severity up to 66.5% and 59.0% at Haramaya and Hirna, respectively. Seed treatment in combination with biofumigation and foliar sprays at two weeks interval increased seed yield gain up to 67.61% at Haramaya and up to 53.13% at Hirna. In addition to reducing disease epidemics and yield increment, integration of seed treatment and biofumigation combined with foliar sprays at two weeks interval provided higher net benefit with higher marginal rate of return. Integration of seed treatment and biofumigation combined with fortnightly foliar sprays provide 1231.7% marginal rate of return at Haramaya and 1055.8% at Hirna. The study provides new possible integration alternatives and ecofriendly means for the management of CBB to both small and large scale bean producers of Ethiopia.

Key words: Biofumigation, CBB, Disease epidemics, Streptomycin, *Xanthomonas campestris*