Title Control of diseases on seed for organic production

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Citation Journal of Plant Pathology Volume 90 (2, Supplement) August 2008, Book of Abstract, 9th International Congress of Plant Pathology, August 24-29, 2008 Torino, Italy,. 507 pages.

Keywords seed; seed borne pathogen

Abstract

Seed-borne pathogens can seriously affect crop yield and quality in organic plant production. The most effective means of control is by exclusion and reduction of inoculum during seed production. For this, a number of measures can be used, including the use of pathogen-free basic seed, resistant cultivars, crop rotation, spacing within or between crops, the control of weeds and crop debris, and the use of appropriate fertilization, irrigation- and hygiene practices. Seed-borne inoculum can also be reduced by treating basic seed or plantlets used for seed production with natural resistance inducers. Several bacterial and fungal extracts, as well as specific organic compounds and micronutrients, have been found to induce resistance against plant pathogens after treatment of seeds or plantlets. Infection and contamination of seed, however, cannot always be avoided. To reduce seed-borne inoculum after seed production, various seed treatments can be applied. Within the EU STOVE project (2003-2006, www.stove-project.net), different physical and biological treatments suitable for use in organic vegetable seed production were developed and evaluated. Physical treatments with hot water, aerated steam and low energy electrons were found highly effective against a number of seed-borne fungal and bacterial pathogens in cabbage, carrot, parsley, bean, pea and lamb's lettuce. It also reduced disease expression in greenhouse and field experiments. From biological treatments tested, including the use of antagonists, antimicrobial compounds and resistance inducers, only thyme oil reduced fungal pathogens to levels comparable to that of physical treatments.