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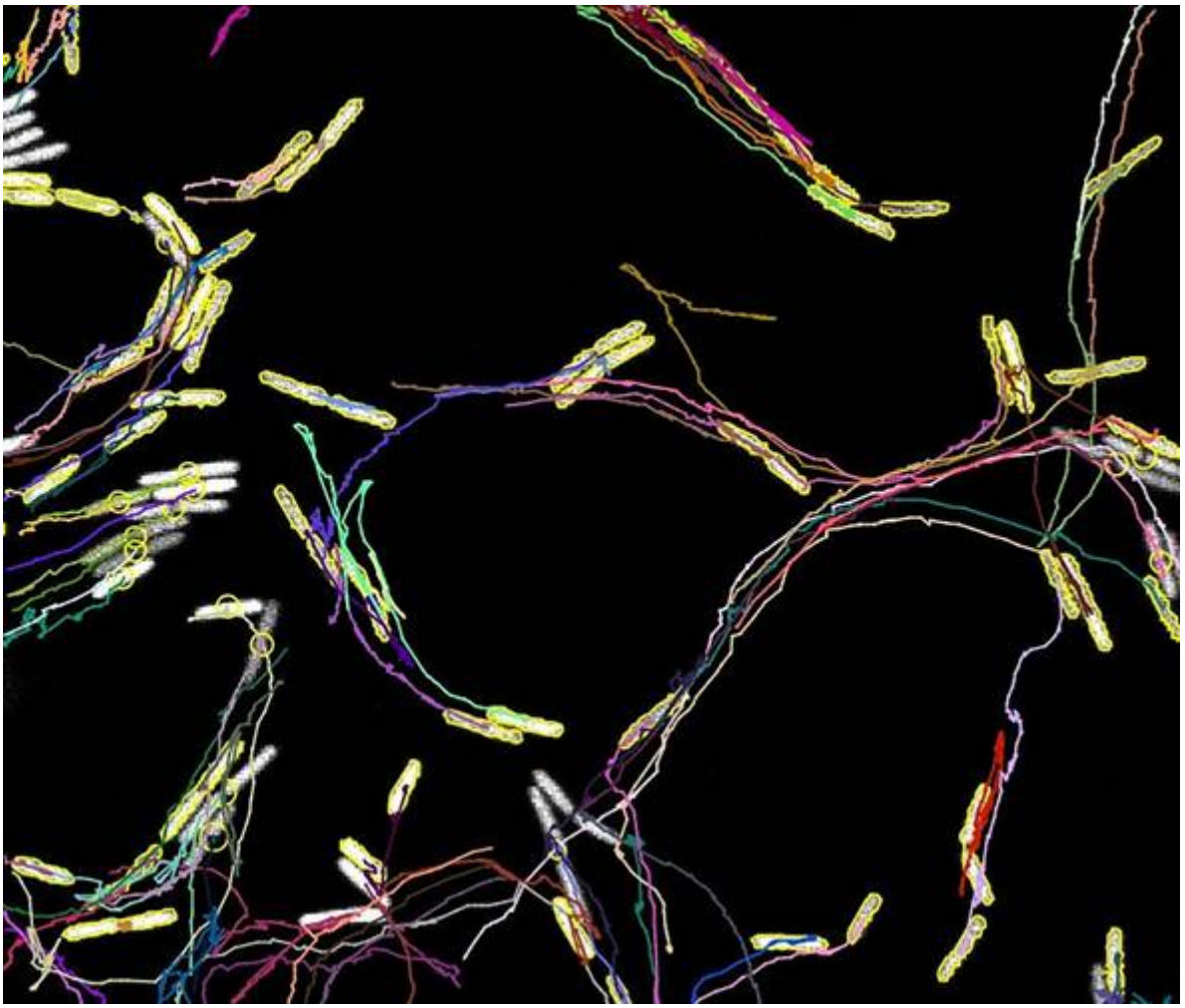

Foto: Se hace camino al andar. Celeste Dea. 1er puesto. Concurso fotográfico SAMIGE 20 años.

COMBINING THE USE OF BIOCONTROL AND CHEMICAL AGENTS FOR INTEGRATED CONTROL OF BLACKLEG DISEASE OF CANOLA

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Blackleg caused by the fungal pathogen Leptosphaeria maculans is the major disease affecting canola. Current control strategies include chemicals fungicides and cultivars/hybrids with genetic resistance to the causal agent. An eco-friendly alternative is the use of biological control agents (BCA) due to multiple advantages. Our laboratory has isolated different biocontrol bacteria, as well as a collection of L. maculans. Our objectives were: 1- to evaluate our BCA against the collection of pathogens and their ability to control disease, 2- to study the compatibility of BCA with chemical fungicides to elucidate if they could be used in combination. First, antagonism was evaluated in dual culture assays between three BCA (Bro5, Bro11 y Bru13) and 139 isolates of L. maculans from different geographical locations. Evaluation of disease control by BCA was performed *in planta* both in growing chamber and greenhouse where disease severity and growth parameters were analyzed. Compatibility of BCA with fungicides utilized in commercial formulations (azoxystrobin and prothioconazole) was achieved by evaluating bacterial growth with different fungicide doses. Finally, in vitro growth inhibition of L. maculans in the presence of both control mechanisms was performed in dual culture assays. Our results demonstrated that all BCA inhibit growth of the majority of L. maculans isolates. The most effective were Bro5 and Bro11 with an average of inhibition of 80% while Bru13 presented an average of 60%. These BCA also showed the ability to control disease severity *in planta*. Particularly, the use of a combination (Bro5+Bro11) showed a decrease of 52% in cotyledon lesions. Moreover, their inoculation showed an increase of 89% in aerial mass of treated plants. Based on these results, we chose this combination for greenhouse experiments. This treatment caused a 58% reduction of stem lesion. Also, we observed an increase in weight (10%) and stem diameter (35%) of treated plants. In terms of compatibility between BCA and fungicides, we observed that azoxystrobin didn’t affect growth of any bacteria, while prothioconazole provoked growth retardation of Bro5 but it didn´t impair growth of Bru13 and Bro11. These results indicate that all BCA could be used in combination con azoxystrobin. So, we evaluated pathogen inhibition in vitro with the combination of this fungicide and BCAs. Thus, we observed that the major inhibitory effect was due to BCAs but we didn´t detect synergistic effects between BCAs and fungicide. Our results indicate that our BCA inhibit growth of most of L. maculans isolates in vitro. Moreover, the combination of two BCAs

was able to control disease development *in planta* and promotes plant growth. Also, these bacteria could be used in combination with certain fungicides, which would reduce the use of chemical agents for disease control. These results contribute to the development of new eco-friendly strategies for blackleg control.

Palabras clave: Canola - Biocontrol - Fungicides - Blackleg - Integrated pest management