Response of powdery scab to the application of zinc and iron amendments in Australia

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Two years of field trials were carried out to determine the response of powdery scab to zinc and iron amendments applied to the soil or foliage of potato plants. Replicated field trials with 15 treatments and two varieties Shepody (susceptible) and Russet Burbank (resistant) were completed at Ballarat in a highly infested field. Fe EDTA, Fe SO_4, ZnO, Zn SO_4 Zn EDTA, Sulfur, at a rate of 50 kg/ha of active, Shirlan 9L/ha and Agrifos 600 16L/ha were soil applied prior to planting. Four weeks after emergence foliar applied treatments were Fe EDTA, Fe SO_4, ZnO, Zn SO_4 Zn EDTA, Sulfur, at a rate of 1 kg/ha of active. Foliar treatments were applied at weekly intervals for 3 weeks. None of the soil applied treatments had an effect on plant emergence. Soil nutrient analysis at tuber set found that available S was increased by sulfur treatments, available Zn was increased by Zn treatments and available Fe was increased by Fe treatments. Plant petiole analysis found that the relative uptake of the nutrients into the plant was dependent on the nutrient, how it was applied and the variety. In 2009/2010, powdery scab on Shepody tubers at harvest was reduced by soil application of S and Shirlan and on RB by soil application of S, Shirlan, Fe EDTA, Fe SO_4 and Zn EDTA and foliar application of Fe EDTA, $FeSO_4$ and ZnO. In 2010/2011, powdery scab on Shepody tubers at harvest was reduced by soil application of S, Shirlan and Zn EDTA and foliar application of S and Fe EDTA and on RB by soil application of S and Shirlan, and foliar application of Fe EDTA and $FeSO_4$. Further research is required to determine if the treatments directly reduce the viability of the pathogen or enhance plant resistance.