P.46 - Weed and disease management in onion

Evenhuis, A., van der Weide, R., van den Brink, L., Scholten, O., Kessel, G., Bleeker, P., Meier, R., Korthals, G., Spits, H., Schepers, H.

Downy mildew caused by *Peronospora destructor* is one of the most severe diseases of onions if not controlled adequately. Onions are therefore intensively sprayed with fungicides to control downy mildew. A research project on integrated control was funded by the Ministry of Agriculture, Nature and Food Quality and the Main Board of Arable Crops. The objectives are to suppress primary inoculum sources and stimulate integrated control of downy mildew, with the emphasis on reduction of chemical input without economic loss. Primary inoculum sources are waste piles, planting material and possibly alternative hosts. Plants can be infested systemically, thus in organic onions sets are treated with warm water in order to start as disease free as possible. By regulation waste piles must be covered. In integrated production fungicides can be sprayed to prevent infection of the bulbs. It is under investigation when this infection of the bulbs occurs and when control measures are most effective. To control an epidemic fungicides can be sprayed based on disease forecast systems. These disease forecast systems are weather based. It is under investigation if these systems can be improved by taking into account disease pressure. Spore traps are used to gather data. Besides that a survey in the province of West-Brabant will result in a lot of data that can be used to improve recommendations and will add more objectivity to the discussion between organic and non-organic growers. In organic production the possibilities of organic compounds to control downy mildew are under investigation. If the epidemic becomes too severe the crop has to be burned with a propane burner before the end of the growing season. This results in loss of yield and quality of the onions. When leaves are wet during the night, sporulation of *P. destructor* is suppressed. In organic production the epidemic can be slowed down by overhead irrigation during the night. Trials are set-up to investigate the possibility of UV-c to kill sporangia of *P. destructor* and its relevance in slowing down the epidemic. Recently two seed companies introduced selections with resistance to downy mildew. Variety resistance can be taken into account to improve integrated control. This project will result in an optimization of integrated control of downy mildew in onions. Besides downy mildew also *Fusarium* is an important disease in onions. Research is ongoing to look into the possibilities to control *Fusarium* with the application of mycorrhizal fungi and also the suppressiveness of different soil types for *Fusarium* and nematodes is being investigated. By integrating innovative mechanical and physical weed control techniques a better cost-effective weed control is developed for onions.