

Screening for resistance of red clover cultivars to invasion of root lesion nematodes

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Red clover is the most widely-grown forage legume in Eastern Canada; it is high-yielding and well adapted to regional growing conditions. Red clover is often used in rotation because it establishes well when underseeded to a spring cereal crop, has a high biomass production, and can fix nitrogen. Unfortunately, red clover can host root lesion nematodes (*Pratylenchus penetrans* (Cobb)) which reduce the yield of many crops, including forage, carrot, strawberry, and vegetable, and reduce the yield and quality of root crops, such as potato. Therefore, the susceptibility of red clover to root lesion nematodes limits its use in crop rotations where this pest is of concern. In the greenhouse, *P. penetrans* has been shown to reduce the yields of red clover (*Trifolium pratense* L.) (Thompson and Willis 1970).

The objective of this study was to evaluate currently-recommended cultivars and new populations of red clover for resistance to root lesion nematode invasion in the greenhouse and under field conditions. Twenty six cultivars were grown in nematode-infected soil in the greenhouse and in the field. The incidence of plants invaded and the nematode concentration in the roots were recorded in both trials (greenhouse and field). The results of this study indicate a wide variability among red clover cultivars in their resistance to root lesion nematode invasion. None of the cultivars studied in this investigation were immune to root lesion invasion, but some hosted lower nematode populations than others. However, the field and greenhouse nematode concentration rankings of the cultivars did show some inconsistencies. For example, two cultivars which had relatively low levels of nematode invasion in the greenhouse, were among the group of cultivars with the highest nematode concentration in their roots in the field study. It is important to note that when results from both trials are considered, four populations showed moderate levels of resistance in both trials. Furthermore, it is interesting to note that the seven cultivars, observed to be among the group of cultivars with the highest levels of nematode invasion in both the greenhouse and field, also had the highest levels of dry matter production. This may indicate that although these cultivars have little resistance to nematode invasion, ie. they are good hosts, they may not be as susceptible to nematode damage. Overall the results of this investigation highlights the existing variation of nematode resistance among and within red clover populations and confirms that further work in selecting for these traits will be productive.

References

Thompson, L.S., and Willis, C.B. 1970. Effect of nematicides on root lesion nematodes and forage legume yields. *Can. J. Plant Sci.* 50: 557-581.