

DISEASES AND NEMATODES IN ALFALFA – WHAT ARE YOUR OPTIONS?

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ABSTRACT

Limiting the potential economic damage of alfalfa diseases in production fields has historically been accomplished by a combination of two main factors; **genetics**, and **cultural practices**. Chemical control is generally considered uneconomical for disease control in alfalfa, with the exception of seed treatments that limit damping off problems under abnormally wet planting conditions. Selecting an **adapted** variety that has genetic resistance is the grower's first line of defense against alfalfa diseases.

The severity of nematode pressure in alfalfa hay fields has increased dramatically in the last 5 years and the ability to minimize economic losses using past practices has been less successful. The recent significant economic losses due to nematodes in the western U.S. and the lack of an economic chemical control option for alfalfa nematodes, appears to necessitate a more integrated approach in minimizing stand and yield losses. One such approach being considered is the utilization of bio-fumigant rotational crops known for their activity against nematodes and/or the expanded use of non-host rotation crops for 1-4 years to eliminate or minimize nematode population numbers before planting alfalfa.

Keywords: Alfalfa, plant pathology, disease control, cultural practices, management, alfalfa diseases, nematodes, non host rotation crops, bio-fumigant crops, integrated pest management

INTRODUCTION

Much progress has been made by alfalfa breeders in the last 30 years improving the genetic resistance of alfalfa varieties to diseases and nematodes. Utilization of these genetic advances in the selection of adapted resistant varieties is still the best and most economical means of insuring maximum yield, quality, and stand life. Variety selection should be based on knowledge of which alfalfa diseases and/or nematodes are prevalent in a grower's field and are historically known to reduce yield and stand life. Knowledge of any potential new disease or nematode outbreaks reported in the area should be also considered in the selection of a variety with resistant traits. Cultural practices for disease and nematode management should use a two pronged approach (1) **Disease Prevention** and (2) **Practices that limit disease build-up and severity**.

Commonly used management practices include the following; (1) buying certified disease free seed; (2) preventing pathogen spread between fields by cutting newer disease/nematode free stands before entering older stands ; (3) Disinfecting equipment between fields to prevent soil and plant residue transfer to un-infected fields. Land preparation and irrigation practices that limit excess water conditions, are beneficial in preventing disease severity. Nematodes can be

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spread very easily thru the reuse of irrigation water from nematode infested fields, and the reuse of tail water should all be avoided if possible

Minimizing forage production losses due to alfalfa diseases and nematodes are normally accomplished by a combination of two factors; **genetics** and **cultural practices**.

CHEMICAL CONTROL OPTION?

When an alfalfa producer encounters a production loss due to a disease or nematode, the first question often asked is there a chemical control that can be applied to the field to eliminate or minimize the problem. Although this solution is often effective when dealing with insects, it is generally not an option when dealing with diseases and nematodes that affect alfalfa production. Very few, if any, chemicals are currently labeled for disease and nematode control in alfalfa, and in most cases those that could provide control would not be economical for alfalfa production.

MAJOR ALFALFA DISEASES AND CONTROL MEASURES

(1) Crown Rot Complex (*Complex of various pathogens: Fusarium, Pythium, Rhizoctonia, Phoma & Stagonospora*)

Control - Resistant varieties; Root knot nematode resistance may also be desirable to complement Fusarium wilt resistance. Variety selection for grazing and/or wheel traffic tolerance may also reduce severity of crown rots that are the result of mechanical crown damage.

(2) Phytophthora root rot (*Phytophthora megasperma f. sp. medicaginis*)

Control - Resistant varieties; cultural practices that promote better drainage i.e. deep plowing, laser leveling, planting on beds and tiling.

(3) Fusarium wilt (*Fusarium oxysporum f.sp. medicaginis*)

Control - Resistant varieties; Root knot nematode resistance may also be desirable to complement Fusarium wilt resistance.

GENERAL CONTROL OPTIONS FOR STEM & ROOT KNOT NEMATODES

- (1) Use Resistant Varieties, preferably those with a High Resistant rating (HR).
- (2) Minimize spread of nematode by limiting reuse of irrigation water from infested fields
- (3) Disinfect/wash swathers and cultivating equipment when moving from old to new fields

Methods of Eliminating or Minimizing Nematode Populations before Planting Alfalfa

- (1) Utilize a **bio-fumigant** Mustard or Radish as a plow-down crop prior to alfalfa plantings
- (2) Use a **non host crop** in the alfalfa rotation to reduce nematode buildup

(a) Stem Nematode ; one to two years of small grain, sorghum, or corn

Rotation – Alfalfa > 2 years small grain > Bio-fumigant crop > Alfalfa (High Res. for SN)

(b) Root Knot Nematode: Non-host crop generally not available due to wide host range.

Use crop fallowing or Bio-fumigant crop before planting alfalfa

Rotation – Alfalfa > fallow > Biofumigant plowdown crop > Alfalfa (High Res for RKN)

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