A review: Symptoms of Root rot of peas and its management

Muhammad Murtaza¹, Haroon Aslam¹* and Kashif Majeed¹

Department of Horticulture Sciences, University of Agriculture Faisalabad Pakistan

*Corresponding author. Haroonaslam51@gmail.com

Volume: 1 Issue: 2
Received: 2018-11-26, Accepted: 2018-12-05, Published: 2018-12-08

Abstract

Root rot is a major threat to the pea crop in all over the world. It causes major losses than any other disease. In wet season it causes more damage, optimum temperature for disease development is 15-30°C or above and moisture content is 30% or more. (Hossain, 2013)There is no resistant variety of root rot but some breeding lines may have tolerance to some extent. Well drained soils suffer less crop damage than poorly drained soils. In the beginning it present in the form of patches then spread all over the field. It is hard to distinguish root rot from wilt disease. The plants effected by root rot can be easily removed from soil than wilted plants. As in case of wilt, roots are not much damaged. Root rot is a complex disease and its severity is increased by stunting growth, Pythium species, lesions and presence of nematode in root zone. (Rots & Pea, 2002)There are 20 different pathogens involve in this disease some of them cause more damage to the crop, for example Fusarium oxysporum, Pythium spp.and Fusarium solani. The cell wall of disease causing fungi is made up of cellulose that’s why it is not a factual fungus because in fungi the cell wall is made up of chitin.
Introduction:

Root rot is a major threat to the pea crop in all over the world. It causes major losses than any other disease. In wet season it causes more damage, optimum temperature for disease development is 15-30°C or above and moisture content is 30% or more. (Hossain, 2013)

There is no resistant variety of root rot but some breeding lines may have tolerance to some extent. Well drained soils suffer less crop damage than poorly drained soils. In the beginning it present in the form of patches then spread all over the field. It is hard to distinguish root rot from wilt disease. The plants effected by root rot can be easily removed from soil than wilted plants. As in case of wilt, roots are not much damaged. Root rot is a complex disease and its severity is increased by stunting growth, Pythium species, lesions and presence of nematode in root zone. (Rots & Pea, 2002)

There are 20 different pathogens involve in this disease some of them cause more damage to the crop, for example Fussarium oxysporum, Pythium spp. and Fussarium solani. The cell wall of disease causing fungi is made up of cellulose that’s why it is not a factual fungus because in fungi the cell wall is made up of chitin.

Due the presence of these pathogens root growth of plant is stopped which results in low availability of the water and nutrients to the plant so, plant show stunt growth and few filled pods. If the environment favor this disease it causes failure of whole crop. Pea is major crop grown in Kashmir with the frequency of 15 to 65% root rot disease. (Hamid, Bhat, Sofi, Bhat, & Asif, 2012)

Symptoms:

Root rot attack on plant at different stages i.e. pre and post emergence of seedling. If it attacks at early stage, death may occur. At the start of disease the lower stem and roots become water saturated. These parts become brown and disease spreads all over the plant. Above ground part of plant shows poor appearance, damping off, yellowing of leaves, poor establishing, falling of mature leaves and poor yield. Roots shows discoloration and stunted growth. When the diseased plant pulled out only tap root intact but sometimes taproot may also be infected. Due to root rot the quality of seed is reduced. Diseased plant produces peas having asymmetrical sizes, low sugar contents and non-synchronized maturity.

As pea is a leguminous crop and nodules are present in its roots that enhance soil fertility by nitrogen fixation. But root rot disturbs this process. The total biomass of plant and yield is reduced. (Chatterton, Bowness, Chang, Agriculture, & Development, n.d.)

Management:

There are many fungicides are present that can be used to manage this disease but these fungicides are very costly and have different dangerous effects on crop product, plant health and soil. And also kill many soil microorganism that are beneficial to plants. So this is a difficult task to manage disease with fungicides. Integrated management approach is considered best for the disease control. (Abawi, Ludwig, Motkan, & Pathology, n.d.)
Cover crops can also be used as a preventive measure. So we can use brassica as a cover crop because it contains glucosinolates (GSL’s) and some products of glucosinolate have preventive effects for many soil borne pathogens (Hossain, 2013).

Root rot is a soil borne disease, its pathogen can live for many years in soil with or without the presence of the host. And it is very difficult to manage this disease due to its long life span.

- If we examine stunted plants in field or plants with yellow leaves, we should pulled them out and clean the soil.
- Cultural practices should be done to avoid this disease.
- To avoid the disease we should use good quality, disease free and fungicide treated seed.
- Soil compaction should be less. In clay soil, more compaction so more chances of disease than silt loam. (“Saprolegnia megasperma,” 1968)
- If less compaction of soil, plant will gain more nutrients , support, good aeration and moisture from soil through roots (Scott, 1984)
References: