Available online at www.pelagiaresearchlibrary.com

Pelagia Research Library

Asian Journal of Plant Science and Research, 2023, 13(03)

ISSN : 2249-7412
CODEN (USA): AJPSKY

Unlocking the Potential of Legumes: Enhancing Crop Productivity and Soil Health

Ozx Bill*

Department of Crop Research, Michigan State University, East Lansing, Michigan, USA

***Corresponding author:** Ozx Bill, Department of Crop Research, Michigan State University, East Lansing, Michigan, USA, E-mail: Bill_O@Hed.US

Received date: March 01, 2023, Manuscript No. AJPSKY-23-16894; **Editor assigned date:** March 03, 2023, PreQC No. AJPSKY-23-16894 (PQ); **Reviewed date:** March 17, 2023, QC No. AJPSKY-23-16894; **Revised date:** March 24, 2023, Manuscript No. AJPSKY-23-16894 (R); **Published date:** March 31, 2023, DOI: 10.36648/2249-7412.13.3.065

Citation: Bill O (2023) Unlocking the Potential of Legumes: Enhancing Crop Productivity and Soil Health. Asian J Plant Sci Res Vol.13 No.3: 065

Description

The production of legumes is severely constrained by root rot-causing diseases. The diseases slow down the germination of seedlings and cause post rise damping off, resulting in poor harvest stands and low yields. Rhizoctonia bataticola, Rhizoctonia solani, and Fusarium solani on chickpea, Rhizoctonia bataticola, Rhizoctonia solani, and Fusarium solani on lentil, and Rhizoctonia bataticola, Rhizoctonia solani, and Fusarium solani on faba bean are among the root rot casing pathogens that have been identified in Ethiopia. In the case of chickpea and faba beans, they can result in yield losses of up to 45 percent and half if they are not appropriately compensated. Based on this data, a review was done to look at some of the current methods for managing root rot in legume crops and make some suggestions for those that are not yet in use. Bio-gent, social practices, and various synthetic compounds were utilized to control this sickness. Trichoderma viride and Bacillus megaterium make up most of the bioagents used to treat this sickness. In the future, particularly in our nation, the capacity for organic disease control must be fully utilized. In order to implement resistance, molecular-based strategies like marker-assisted selection are typically required when developing resistant varieties.

Reliable Source of Protein

There are approximately 690 genera and 18,000 species in the leguminosae (pea or bean family). Following the Gramineae, it is the second-biggest group of seed plants. There are 18 to 20 types of leguminosae that are generally developed for their eatable, high-protein seeds. The seed of vegetables are second to oats as the fundamental wellspring of sustenance for individuals and animals. “Food legumes” refer to the majority of leguminosae species whose seeds, pods, or leaves are consumed by humans. The dry, mature seeds that humans consume are referred to as “pulse” in India and Pakistan, two of Great Britain’s colonized nations.

In Ethiopia, smallholder occupations rely upon vegetables, which possess around 13% of developed land and record for roughly 10% of the horticultural worth added. In the country, these vegetable yields assume a negative part. As a higher-value crop than oats, they increase smallholder pay and help people lose weight. They are also a reliable source of protein, accounting for approximately 15% of protein intake, and they fill significant amino acid deficiencies in grains. Also, beats offer customary soil support benefits through nitrogen-fixing, which further creates yields of grains through crop turn and can moreover achieve venture assets for smallholder farmers from less excrement use. Additionally, Ethiopia’s balance of payments is significantly impacted by pulses. They are the third most exported crop, behind coffee and sesame, and in 2007/08, they contributed USD 90 million to export earnings. The primary obstacles to the production of these crops are diseases, insect pest attacks, poor agronomic practices, and a lack of improved cultivars and crop protection technologies. The fact that the recommended crop protection technologies of the participatory approach are not widely utilized is also one of the primary socioeconomic factors contributing to the low productivity of these crops. The production of legumes is severely constrained by root rot-causing diseases. The

diseases slow down the germination of seedlings and cause post rise damping off, resulting in poor harvest stands and low yields. Diseases that can spread through seeds are to blame, but the majority of farmers use seeds from previous harvests, which goes against the idea of using sanitary methods. The goal of this study was to look at some of the current approaches to controlling root rot in legume crops and make some suggestions for those that haven't been tried yet.

Organic Control

Due to the persistently cool and wet weather, root rot frequently occurs after the seedling emerges. One of the symptoms, stunted, yellow plants, may be mistaken for nitrogen. When the plant is removed, its roots will be significantly thinner than those of a healthy plant, or there may be no secondary roots at all. The microbe that is contaminating the roots determines the type and pattern of staining that will occur on the roots. There are four main types: Aphanomyces root decay, Fusarium root decay, Pythium root decay, and Rhizoctonia root decay (exposed fix). Crop revolution is unlikely to survive because these infectious diseases affect such a wide range of hosts. Rhizoctonia solani, a fungus, is to blame. The first diagnostic criteria are poor or declining stands. Root development is poor, and the majority of the roots are dark and fragile. Rhizoctonia root rot can harm peas at relatively low soil temperatures (65°F or 18°C), but it is more aggressive in warmer temperatures (76°F to 86°F or 24°C to 30°C). Rhizoctonia can cause disease and infection at a wide range of soil moisture levels.

Treatment of seeds the methods currently in use to control the fungal pathogens that cause root rot have not yet reached their full potential. The essential method for forestalling root decay and other root sicknesses are appropriate sterilization and the utilization of clean establishing materials. Chemical seed treatment is frequently applied prior to planting to avoid damping off, seed and seedling rot, and other fungal diseases. At the point when synthetic seed medicines and rhizobia inoculants are utilized together, nonetheless, issues emerge. The seed fungicide might smother the rhizobia microbes' viability or neglect to safeguard against the planned microorganism in certain examples. Finally, their results showed that seed treatment with fungicide (Copper oxychloride) and soil application of Trichoderma disconnect, a potential parasite, and bacterial bio-control specialist was the best because it had the highest germination rate (100 percent), highest initial population (0.00), and last population.

An effective and non-hazardous strategy for reducing crop damage caused by plant pathogens is proposed to be biological control. The faba bean was used to test how Trichoderama viride prevents plants from getting the infection known as black root rot in a greenhouse. This study's discoveries propose that faba bean dark root decay can be controlled utilizing the organic control specialist Trichoderama viride. As antimicrobial or disease resistance inducers, synthetic plant resistance inducers like Salicylic Acid (SA) and Hydrogen Peroxide (H2O2) were utilized in another international study. It found that the tried bio-control specialists and substance inducers altogether decreased the direct development of dark decay packaging parasites, either separately or in mix. In general, using biocontrol agents and chemical inducers together was more effective than using each separately.