



**STUDIES ON ALTERNARIA DISEASES OF VEGETABLE CROPS
AND ITS MANAGEMENT CONTROL**

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ABSTRACT

Vegetables represent the foremost necessary and low cost constituents of a diet, which individuals currently notice because of their high alimetal values indispensable for the body. There are reports concerning the increasing demand of brassicaceous vegetables in market. Asian nation has second position in vegetable production within the world, next solely to China with an annual production of eighty one million tonnes from 5.1 million hectares of land.

KEY WORDS: *foremost necessary and low cost constituents.*

INTRODUCTION

During the last 20 years, hefty stress has been arranged on increasing production of vegetable crops in India [6]. However, the diseases caused by Alternaria square measure the main factors chargeable for low production of dicot family, brassicaceous and asterid dicot family. the total crop destroyed by the blights and caused the intense unwellness quickly in a very few days. Therefore, the matter deserves immediate and effective measures of management.

The Pathogen: The Genus Alternaria Classification

Phylum	:	Ascomycota
Division	:	Deuteromycotina
Sub-division	:	Pezizomycotina
Class	:	Hyphomycetes
Order	:	Pleosporales
Family	:	Dematiaceae



Alternaria Nees. ex Fr. ar cosmopolitan, living each as saprophytes yet as weak parasites. The formation of polymorphous conidia either individually or briefly or longer chains is identifying this genus. it's longitudinal yet as oblique septa and longer or short beaks. The spores of those polyphagus fungi occur usually within the atmosphere and additionally in soil. The telomorphs (sexual stage) ar better-known in a very only a few species and placed within the genus Pleospora of sophistication Loculoascomycetes of sub-division division,

within which sleeper-shaped, muriform ascospores are created in bitunicate asci. According to report, the characteristic options of variety of *Alternaria* species represented in "Dematiaceous Hyphomycetes" and "More Dematiaceous Hyphomycetes". The spores of *Alternaria* species are invariably multi-celled and infrequently beaklike. The cells are separated transversally and longways. Spores are dark and borne individually or chained. The subsequent diseases chiefly have an effect on the foliage of those crops and might lead to losses in business fields and residential gardens.

Table-1 Some *Alternaria* species and the diseases they cause on specific hosts

S. No.	<i>Alternaria</i> species	Cause on specific hosts
1.	<i>Alternaria dauci</i>	Carrot leaf blight
2.	<i>Alternaria radicina</i>	Black rot of carrot
3.	<i>Alternaria brassicae</i> and <i>brassicicola</i>	Leaf spot of crucifers, <i>Alternaria</i> infests many vegetables and roses
4.	<i>Alternaria solani</i>	Tomato early blight and fruit rot
5.	<i>Alternaria brassicicola</i>	Broccoli headrot, grows on cole crops
6.	<i>Alternaria tenuis</i> and <i>Alternaria alternata</i>	Fruit spot on peppers
7.	<i>Alternaria arborescens</i>	Stem canker of tomato
8.	<i>Alternaria arbusti</i>	Leaf lesions on Asian pear
9.	<i>Alternaria blumeae</i>	Lesions on <i>Blumea aurita</i>
10.	<i>Alternaria brunsi</i>	Cumin bloom blight
11.	<i>Alternaria carotiincultae</i>	leaf blight on carrot
12.	<i>Alternaria carthami</i>	Grows on parsnip
13.	<i>Alternaria cinerariae</i>	Grows on parsnip
14.	<i>Alternaria citri</i>	grows on parsnip
15.	<i>Alternaria conjuncta</i>	grows on parsnip
16.	<i>Alternaria dianthi</i> <i>Alternaria dianthicola</i> <i>Alternaria euphorbiicola</i>	Infests cole crops
17.	<i>Alternaria gaisen</i>	Ringspot disease of pears
18.	<i>Alternaria helianthicola</i> <i>Alternaria hungarica</i> <i>Alternaria infectoria</i>	Infests wheat
19.	<i>Alternaria japonica</i>	Infests cole crops
20.	<i>Alternaria limicola</i> Section Porri	Earliest diverging lineage of
21.	<i>Alternaria linicola</i> , <i>Alternaria longipes</i>	Infests tobacco
22.	<i>Alternaria molesta</i>	Skin lesions on porpoises
23.	<i>Alternaria panax</i>	Causes ginseng blight
24.	<i>Alternaria petroselini</i>	Causes parsley leaf blight
25.	<i>Alternaria radicina</i>	Causes carrot decay
26.	<i>Alternaria raphani</i> , <i>Alternaria saponariae</i> , <i>Alternaria selini</i>	Causes parsley crown decay
27.	<i>Alternaria senecionis</i> , <i>Alternaria solani</i>	Causes early blight in potatoes and tomatoes
28.	<i>Alternaria smyrnii</i> , <i>Alternaria tenuissima</i> , <i>Alternaria triticina</i> , <i>Alternaria zinniae</i>	Infests alexanders and parsleys

Biology of the Disease: Alternaria Leaf Blight

The flora malady of carrot leaf and petioles caused by Alternaria is common. Whereas this malady not hurts directly however yield loss happens once petioles become thus brittle thanks to mechanical harvest effort carrot foliage and root within the ground. The spots of Alternaria leaf detached chop-chop in heat and damp weather in order that the whole field might seem to possess been slashed by chemicals and frost. Severity of crop loss are further once plants become infected early within the season. On watermelon and muskmelon Alternaria blight is principally found, however might occur on, squash cucumber, gourds and pumpkin. This malady have an impression on foliage and infrequently on fruit. Alternaria blight caused by plant Alternaria dauci, primarily attacks older plants, although seedlings may additionally be infected.

Symptoms

Among the various diseases caused by the genus Alternaria, blight malady is most dominant one that causes average yield loss within the vary of 32-57% [1]. Symptoms of this malady embrace presence of irregular, typically circular brown to dark brown color leaf spots having homocentric lines among the spots. malady symptoms 1st seem on older leaves as little death spots which will be enclosed by a yellow halo. typically the circular spots coalesce to make giant patches leading to the blight. In quite an few cases dark colored little spots are shaped on pods and tender twigs [6-8]. For Alternaria blight management, early sowing [7] of properly hold on clean certified seeds when deep tilling beside clean cultivation, appropriate weeding and optimum plant population , turning away of irrigation at flowering and pod formation stages ar few steps followed for well organized management of the malady.

Cause and Disease Development

Conidiophores of majority of the species of Alternaria manufacture parthenogenetic spores (conidia) measurement between 160- two hundred two hundred long. beneath in vitro conditions, monogenesis happens at a temperature vary of 8-24 °C, whereas once 14-24 h mature spores occur. Favourable temperatures ar between sixteen °C and twenty four °C wherever monogenesis time ranges from twelve to fourteen h. Presence of wet within the sort of rain, condensation or high wetness ar essential for infection and a minimum of 9-18 h ar needed for majority of the species [2-3]. Continuous wet of twenty four h or longer much guarantees infection [7-10]. sizable amount of Mature spores manufacture in twenty four h if ratio is larger than ninety one.5% (at twenty °C) [3].

Between crops, plant pathogenic Alternaria species survive as spores and mycelium in infected plant residues or in and on seeds. Seed borne fungus may attack seedlings, resulting damping-off, stem lesions, or collar rot. Most often, how- ever, the fungus grows and sporulates upon plant residues during rain, heavy dew, or under conditions of good soil moisture. Spores are windblown or splashed onto plant surfaces where infection occurs. For germination and infection, spores must have good moisture. Host penetrates directly either through wounds, or through stomata. Stressed, weak, old, or wounded tissues are more liable to invasion than sound, vigorous tissues.



Fig-1 Alternaria leaf blight on Muskmelon leaves



Fig-2 Leafspot of crucifers caused by *Alternaria brassicae*, showing the typical target spot composed of concentric rings.

Disease Cycle

The fungi that cause Alternaria blight overwinter in pathologic plant detritus and on wild perennial hosts. The flora will survive in detritus for two years. Alternaria might also unfold on or in contaminated seed- the first means that of transmission to new production areas. Throughout the season, spores square measure unfolds by wind, water, and field instrumentation. Infection needs leaf status, which permits spores to enter through pores within the leaves. Lesions seem 3-5 days later and shortly become supply for brand new inoculums. However, they can't persist free within the soil for too long once the tissues square measure completely rotten. The length of your time the crop residue persists in soil depends on style of soil and favourable environmental conditions. the speed at that unwellness unfold within the field depends on the on the market initial level of matter (contamination of seed and/or established residues), air temperature, and therefore the presence of water within the kind of condensation, rain, irrigation or high humidness. Infection caused by *Alternaria dauci* is favored by moderate to heat temperatures and status of the leaf. With the rise in temperature, the period of leaf status decreases to needed for infection to occur between 8-12 h infection happens at temperatures of 16-25°C (61-77°F). Upon dead death tissue, the flora without delay sporulates leading to the germination of spores in water droplets and condensation.

Disease Management

Alternaria is difficult to control so prevention is the best strategy. A number of *Alternaria* species infect the vegetable crops belonging to several families and reduce yield both qualitatively and quantitatively. Hence, there is a strong need to effectively control this polyphagus, destructive group of fungi. There are several methods, which are being employed for this purpose.

Cultural Practices

Harvesting crops on time will contribute to reduced crop loss as a result of the leaf blight diseases. Immediate plowing below the crop debris will decrease inoculum build-up and survival of leaf blight pathogens. For decomposition of crop residue and also for reducing fungal and bacterial leaf blight pathogens and their diseases, it is more significant to practice a minimum of a 2 year crop rotation. Practices like wider row spacing, breaking compacted layer, and planting on raised ridges helps in reducing leaf witness duration and soil mloisture will be helpful. Generally, *Alternaria* leaf blight is more severe on poorly fertilized and stressed carrots. Therefore, keeping injured free crops and vigorously growing (proper fertility,

gibberellic acid application) resulting from chemical applications will aid in the control of Alternaria leaf blight.

By Planning In fields, the planting of prone varieties shall be avoided with infected residues from a previous crop retained on the surface.

By Ground Preparation Earlier crop residue shall be incorporated. A part from this, balanced crop nutrition especially of potassium should be provided.

By seed treatment this method is an effective measure in controlling Alternaria diseases as it helps in reducing primary inoculums. The best way to proactively reduce the severity of the leaf blight diseases is to use vigorous, healthy and treated seeds for reducing or eliminating this potential inoculum source. To control Alternaria diseases in cabbage, seeds were treated in hot water for 30 min at 50°C was recommended by Walker [1] while, to eradicate Alternaria infection from Brassicaceae seeds [9] recommended same temperature for 25 min. Seed treatment with Mycostop -a powdery formulation of spores and mycelium of *Streptomyces griseoviridis* was recommended to control *A. brassicicola* damping-off [2]. Mixed fungicide treatments have also been found to effectively control various Alternaria infections. In chilli seed treatment with Thiram + Captan (1:1) 0.3% and four sprays of Zineb (0.25%) were found quite effective to control Alternaria diseases [5].

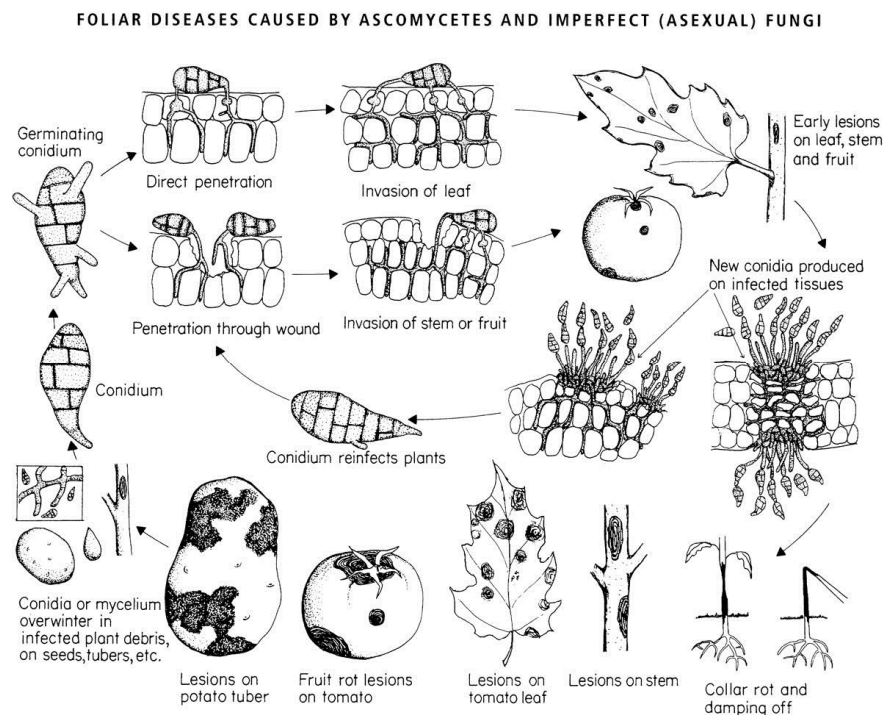


Fig-3 Development and symptoms of diseases caused by Alternaria.

CHEMICAL MANAGEMENT

Alternaria, Cercospora and bacterial leaf blight are control by various effective materials that are listed in the Integrated Crop and Pest Management Guidelines for Commercial Vegetable Production provided by Cornell's Cooperative Extension program. In Canada, research showed that the 25% disease occurrence as a threshold for timing the first fungicide application for controlling Alternaria and Cercospora disease

CONCLUSION

From the above study, it is concluded that the Alternaria is a very destructive fungus for vegetable crops, but with the application of advanced techniques, it is easier to control this cosmopolitan fungus. One of the most commonly used method is the use of fungicides, but these fungicides causes serious health hazards to human beings and also they cause environmental pollution. Hence, nowadays more emphasis is given on other methods of disease control like growing variety which is disease free, using plant and natural products, bio-control agents and alterations in agronomic practices etc. because they are cost-effective, eco-friendly and safe to use.

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