Lentil Rust

Pathogen: *Uromyces viciae-fabae*

Taxonomic position of the pathogen: Sub-division: Basidiomycotina; Class: Teliomycetes; Order: Uredinales; Family: Puccniaceae

Distribution and Importance: Rust of lentil is widespread globally. The disease has been first reported from India by Butler (1918). Later the disease has been reported from several countries viz., Cyprus, Morocco, Palestine, Portugal, Bulgaria, Turkey, Iran, Israel, Chile, Hungary, Syria, Bangladesh, Pakistan and Nepal. In India, severe outbreak of lentil rust was reported from Haryana, Delhi. Madhya Pradesh, Bihar, Uttar Pradesh and other lentil growing areas. Yield losses varied from 10-60 per cent depending upon cultivar and disease severity.

Symptoms: Generally symptoms occur during the flowering /early podding stage. The rust pathogen attacks all aerial parts of the lentil plant. Symptom starts with the formation of yellowish-white pycnidia and aecial cups on the lower surface of leaflets and on pods, singly or in small groups in a circular form. Later, brown uredial pustules emerge on either surface of leaflets, stem and pods. Pustules are oval to circular and up to 1 mm in diameter. They may coalesce to form larger pustules. The telia, which are formed late in the season, are dark brown to black, elongated and present mainly on branches and stems. In severe infections leaves are shed and plants dry prematurely, the affected plant dries without forming any seeds in pods or with small shrivelled seeds. The plant has a dark brown to blackish appearance, visible in affected patches of the field.

Pathogen: *Uromyces viciae-fabae* is an autoecious, macrocyclic rust fungus, i.e. all five spore stages (spermagonial (pycnial), aecial, uredinial, telial and basidial) occur, and there are no alternate hosts but, it has collateral hosts. Rust completing its life cycle on lentil. The aecia of *U. viciae-fabae* are amphigenous or hyphyllous (both side of leaves), usually in groups surrounding the pycnia or sometimes scattered, cupulate, 0.3-0.4 mm diam. The aeciospores are spheroidal, 18-26 µm diam. Uredia are amphigenous and on the petioles and stems, scattered, cinnamon, 0.5-1 mm diam. Uredospores are single celled, pedicillate, ellipsoidal or obovoidal 22-28 x 19-22 µm; very finely echinulate. Telia are like the uredia but black. Teliospores are single celled, ellipsoidal, obovoidal or cylindrical, rounded or subacute smooth.

Disease Cycle: Lentil seed may be contaminated with pieces of rust-infected leaf and stem which can act as primary inoculum for the recurrence of the disease in most years. Rust may also perpetuate on weed hosts from where it may infect lentil crops by windborne teliospores. High humidity, cloudy or drizzly weather with temperatures 20 to 22°C favour disease development. The disease generally occurs during the flowering/early podding stage. Aeciospores germinate at 17-22°C and infect other plants forming either secondary aecia at temperatures of 17-22°C or uredia at 25°C. Uredosori develop later in the season and are rapidly followed by telia. After harvest, aecia and uredia present on lentil trash die out, but teliospores tolerate high temperatures and allow the fungus to survive the

summer. At lower temperatures, uredospores could be an important means of survival. Uredomycelium is highly resistant to heat and sunlight and is probably important for continued development and survival of rust in hot, dry conditions. The predominant form of survival will vary with the environment and location. Teliospores germinate at 17-22°C without a resting period and cause new outbreaks of the disease each season.

Management:

1. Destruction of the crop refuses after the harvest.
2. Always use clean and healthy seeds
3. Early sowing (October) caused high disease severity compared to late sowing (December).
4. Grow resistant varieties such as Pant L. 4, Pant L 6 Pant L. 209, Pant L. 406 , NP-47, PDL-1, Vipasha, Pusa-10, UPL172, LG176, Shekhar 4, Shekhar 5
5. Use foliar spray of fungicides such as Mancozeb (0.2%), Bayleton (0.05%) and Calixin (0.2%) are found effective against the pathogen.