(1999) also reported that overnight priming of chickpea seeds with water resulted in an early emergence and enhanced plant height, number of pods, seed yield, and residue yield of chickpea crop grown in harsh conditions of high Barind Tract of Bangladesh. They reported an increase in seed yield of about 47%. The biochemical events responsible for higher seed yield are not yet known. However, during seedling growth of primed chickpea seeds, increased activities of amylases, invertases, sucrose synthase, and sucrose phosphate synthase were observed in the shoots of primed seedlings in comparison with non-primed seedlings (Kaur et al., in press). These enzymes could be responsible for better plant growth and yield.

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References

Harris, D., Joshi, A., Khan, P.A., Gothkar, P., and **Sodhi, P.S.** 1999. On-farm seed priming in semi-arid agriculture: development and evaluation in maize, rice and chickpea in India using participatory methods. Experimental Agriculture 35:15–29.

Kaur, S., Gupta, A.K., and **Kaur, N.** In press. Effect of osmo- and hydropriming of chickpea seeds on seedling growth and carbohydrate metabolism under water deficiency stress. Plant Growth Regulation.

Musa, A.M., Johansen, C., Kumar, J., and **Harris, D.** 1999. Response of chickpea to seed priming in the high Barind Tract of Bangladesh. International Chickpea and Pigeonpea Newsletter 6:20–22.

Ozbingol, N., Corbineau, F., and **Come, D.** 1998. Response of tomato seeds to osmo-conditioning as related to temperature and oxygen. Seed Science Research 8:377–384.

Passam, H.C., and **Kakouriotis, D.** 1994. The effects of osmo conditioning on the germination, emergence and early plant growth of cucumber under saline conditions. Scientia Horticulturae 57:233–240.

Pathology

First Occurrence of Foot Rot of Chickpea Caused by *Operculella padwickii* in Bangladesh and Nepal

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Diagnostic surveys were conducted in March 1999 crop growing season to determine the prevalence of diseases of chickpea (*Cicer arietinum*) in the rice (*Oryza sativa*)-wheat (*Triticum aestivum*) based cropping systems of Bangladesh and Nepal. A new disease of chickpea, foot rot, caused by the fungal pathogen *Operculella padwickii* was observed for the first time in the village Gwaliarpur on Faridpur-Rajbari road in Bangladesh. Later on foot rot was also observed in farmers' fields in the districts of Jessore, Jhenaidah, Magura, Faridpur, Rajbari, and in Barind area of district Rajshahi. The disease was also observed in chickpea trials at the Regional Agricultural Research Station (RARS), Ishurdi, Pabna district, Bangladesh. The disease incidence ranged between 1% and 10% across locations and sites surveyed.

Foot rot was also observed in both farmers' fields and research stations in the major chickpea-growing areas in Nepal. Several national and international on-station trials which included improved high-yielding cultivars at the National Grain Legumes Research Program (NGLRP), Rampur, RARS, Khajura, Banke, and RARS, Tarhara in Nepal had substantially high incidence of the disease (10–25%). The disease incidence varied from 1% to 25% in farmers' fields irrespective of chickpea cultivars sown.

Foot rot is often confused with fusarium wilt (*Fusarium oxysporum* f. sp *ciceris*), collar rot (*Sclerotium rolfsii*), and root rot (*Rhizoctonia solani*) but the symptoms are distinctly different from these diseases. Foot rot affects

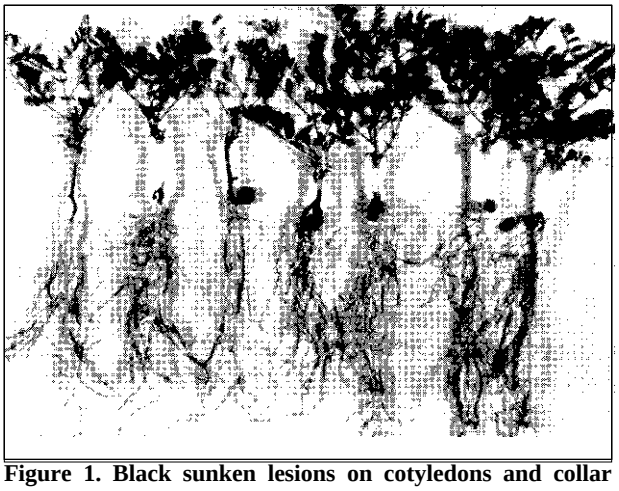

Figure 1. Black sunken lesions on cotyledons and collar region of chickpea plants.

the collar region and tap root of the plant. It produces dark brown to black sunken lesions on cotyledons and collar region of the plant (Fig. 1). Later the lesions enlarge, become sunken, dark brown to black, extending to the epicotyl and basal tap root of the plant. In advanced stages of disease development, a complete girdling of the plant in the collar region takes place (Fig. 2), resulting in wilting and death of the plants. The leaves of affected plants are pale green and finally become straw colored. There is no drooping of petioles and leaflets and vascular discoloration as in fusarium wilt; however, distinct browning of phloem takes place. The fungus produces white mycelium and pycnidia (270–810 µ in diameter). Conidiophores are of two kinds: short conidiophores, which are simple, appear as lining on the wall of pycnidium, and bear spores terminally; and long conidiophores which are branched, sometimes septate, and bear spores laterally as well as terminally. The spores are hyaline, irregular in shape, and yellowish-white measuring 7.4–16.6 µ × 5.5–11.1 µ. The pathogenicity was confirmed by planting seeds of chickpea variety Nabin in *O. padwickii*-sick plots. The pathogen *O. padwickii* was reisolated from the diseased plants. This is the first report of *O. padwickii* on chickpea in Bangladesh and Nepal; however, it was first reported from Karnal in Haryana state of India

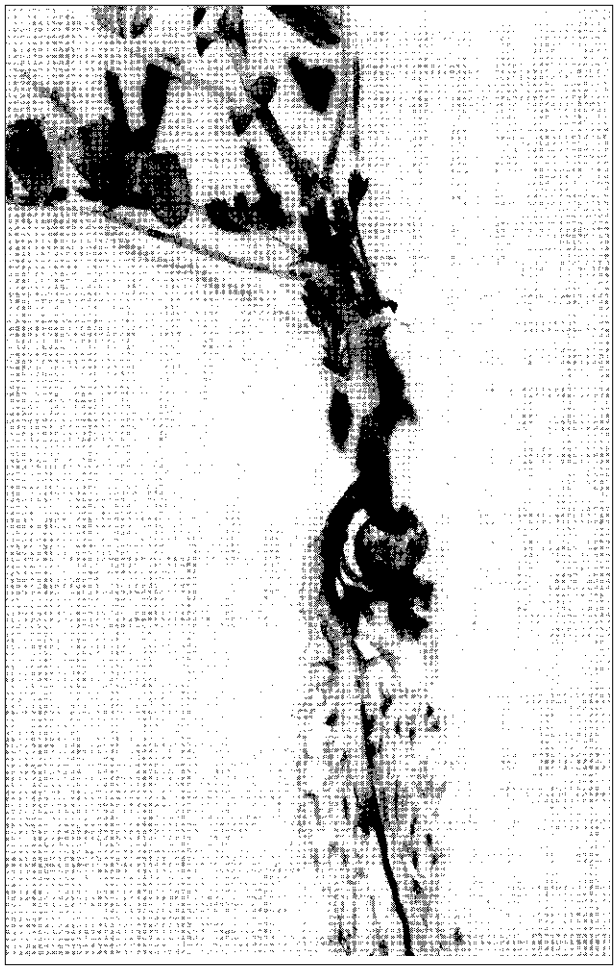

Figure 2. Girdling of chickpea plant in the collar region.

(Kheswalla 1941) and later on from Gurdaspur in Punjab, India causing 53–70% damage to chickpea crop in certain environments and fields.

Reference

Kheswalla, K.F. 1941. Foot rot of gram (*Cicer arietinum* L.) caused by *Operculella padwickii* nov. gen. nov. sp. Indian Journal of Agricultural Sciences 11:316–318.