ficant reduction of fungi in both the cultivars. Amongst the seven different fungicides, Agrosan G.N. and Ceresan at 0·33% and 0·5% proved superior in reducing the microflora of the two cultivars. The others then followed in she order Agallol, Thiram, Brassicol, Captan and Mercuric chloride.

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HORIZONTAL SPREAD OF SHEATH BLIGHT TO RICE PLANTS IN RELATION TO SPACING AND NITROGEN APPLICATION

TWO phases of development of sheath blight infection to rice plants have been recognised—horizontal spread, *i.e.*, infection to contiguous plants, and upward *spread, i.e.*, infection to upper leaf sheaths of the same plant (*See* Ou[6]). Although, basidiospores of the causal fungus, *Coricium sasakii* (Shirai) Matsumoto, are known to develop under field conditions. they occur rarely. Therefore, horizontal spread by direct contact is considered to be the chief mode of spread of the disease in field. High doses of fertilizers, particularly nitrogen, are supposed to be conducive for the development of the disease. The present work aims at monitoring horizontal spread of the disease to rise plants under two spacings with two doses of nitrogen.

Experimental

Rice, cv. 'Pusha 2–21' was raised in nursery beds and 28 days later were transplanted in rectangular plots (4·25 × 2·25 c) under two spacings, 25 × 25 cm (S_2) and 15 × 15 cm (S_1), each in two nitrogen doses, 200 (N_2) and 50 kg (N_1) urea/ha, on 20 July 1976. Each of the treatments was replicated eight times under completely randomized design. There were 17 × 9 rows in each plot under S_2 and 25 × 13 rows in those under S_1. At the time of transplanting, the entire quantity of the phosphatic and potassic fertilizers were applied to the plots as basal dressing in forms of single superphosphate @ 240 kg and muriate of potash @ 60 kg/ha, respectively, and a part of nitrogen in form of urea @ 18·6 kg/ha was also added. Rest of the quantity of urea was applied 20 days after transplanting in a single instalment in plots receiving low dose of nitrogen and in two equal instalments 20 and 32 days after transplanting in plots receiving high dose of nitrogen.

Two seedlings were transplanted per hill except in the case of two per plot where 5 seedlings were put. These two hills were located equidistantly from the three sides as well as from the centre and were artificially inoculated on 16 August 1976, *i.e.*, 55 days after sowing. *C. sasakii* was grown on sterilized rice grains[2] in 500 ml Erlenmeyer flasks for 13 days. All the sheaths of all the tillers of these two hills were inoculated by inserting the grains (inocula) in between sheaths and stems. Observations were taken 35 days after inoculation.

Results and Discussion

Under both the spacings of 15 × 15 and 25 × 25 cm, more number of plants were infected in plots receiving high lose of nitrogen but the spread was greater under close spacing than wide spacing (Table I). When analysis of variance was done, effect of nitrogen was found to be significant (F ratio = 6·73) in the spread of the disease and that of spacing narrowly failed to be significant (F ratio = 3·75).

TABLE I

Percentage of rice plants (Pusa 2–21) infected by sheath blight in different treatments of spacing and nitrogen application

Treatment	% of plants infected per lot
S_1N_2 (15 × 15 cm, 200 kg urea)	10·18 *a*
S_2N_2 (25 × 25 cm, 200 kg urea)	8·67 *a*
S_1N_1 (15 × 15 cm, 50 kg urea)	7·95 *ab*
S_2N_1 (25 × 25 cm, 50 kg urea)	5·22 *b*

S.Ed. = 1·55
C.D. (5%) = 3·17.

Loo *et al.*[5] stated that sheath blight was favoured by close planting and high nitrogen application; Hashioka[1] and Kōzaka[4] also emphasized about positive relationship of high nitrogen content of soil and severity of sheath blight. Spread of the disease was found

to be faster in a field of susceptible variety than that of a resistant variety and in spacing of 20 × 20 cm than 25 × 25 cm[2]. In another experiment at the International Rice Research Institute, Los Ba os, it had been observed that yield loss of a susceptible variety was significant at three levels of disease intensity and in both high and low levels of nitrogen but in a moderately resistant variety the loss was significant only at the highest level of disease intensity and high nitrogen level[3]. However, information about interaction of spacing with nitrogen application on the spread of the disease seems to be inadequate. Present study shows that although high nitrogen dose enhances the disease development, by transplanting seedlings 25 cm apart both ways, the intensity can be reduced to some extent.

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ON THE OCCURRENCE AND DISTRIBUTION OF ANGIOSPERMIC PARASITES IN ASSAM

THE common occurrence of angiospermic parasites in Assam *viz.*, Cuscuta reflexa Roxb. (Total stem parasite); *Cassytha filformis* L,, *Dendropthe falcata* L.f. etting syn. *Loranthus longiflorus* Desr., *Tolypanthes involucrates* (Roxb). Van Tiegh Syn. *Loranthus involucratus* Roxb., *Scurrula parasitica* L. Syn. *Loranthus Scurrula* L, *Viscum monoicum* Roxb. (Total stem to taxonomists to study their mode of infection, Loeffl. (Total root parasites) offer an interesting field parasites); *Orobanche aegyptiaca* Pers. and *O. cernua* nutrition. nature of growth and distribution.

These different angiospermic parasites grow naturally on branches, twigs or roots of different hosts which may be of large or small trees, shrubs, herbs or climbers of the State. The extent of parasitism as well as the nature of distribution of *C. reflexa* Roxb. *D. falcata,* L. f. etting, *S. parasitica* L., etc., on different hosts has been studied by several workers [1,7,8,14,17]. All these species described are indigenous throughout the State except *O. cernua* Loeffl. Kanjilal *et al*[9] also indicated the indigenous nature of these different types of stem parasites. Chaudhuri[3] showed the occurrence of only one species of *Cassytha* L. in Assam. However, stem parasites such as *C. reflexa* Roxb. *S. parasitica.* L, *D. falcata* L.f. etting, *V. monoicum,* Roxb. are widely distributed in Assam and more common than the other stem parasites; *C. filiformis* L. is rare whereas, root parasites, *O. cernua,* Loeffl. and *O. aegyptiaca* Pers. are seasonal and scarce.

Different hosts attacked by different angiospermic parasites have been observed and majority of the stem parasites parasitize different hosts as their natural habitats are. *Aegle marmelos* Corr, *Albizzia lucida* Benth, *A. procera* Benth, *Citrus decumena* L, *Dillenia indica* L., *Duranta plumieri* Jacq., *Erythrina indica* Lamk. *Ficus bengalensis* L., *F. religiosa* L., *Hydnocarpus kurzii* King, *Lagerstromia flos-reginae* Retz., *Mangifera indica* L., *Mimusops elengil* L, *Streblus asper* Lour, *Syzigium cuminii* Skeels, *Tamarindus indica* L., *Tectona granris,* Lf, *Vatica lanceaefolia* Bl, *Vitex negunda* L, *Zizyphus jujuba* Lamk etc., and of these *A. lucida* Benth. *D. indica* L, *D. plumieri* Jacq, *E. indica* L, *M. indica* L., are most common hosts of this locality and root parasites are found to parasitize the cultivated species, *viz. Brassica oleracea* L, *Nicotiana tabacum* L, *Solanum melongana* L. etc.

Investigations[1,2,7–12,14–16] which have been carried out on the occurrence of different types of hosts, parasitized by different angiospermic parasites. are in agreement with the present investigation in the majority of the cases and no detailed list therefore has been made to show their habitats. It is interesting to note that although these parasites have wide range of hosts covering about 58 families, no monocot host has been recorded in the present study.

As all these different types of species are generally ectoparasites, the environmental factors have profound influence on the growth and spreading habit, which keep a perfect relation with the harbouring hosts for continued advantage of water, organic and inorganic nutrients. Leafy misteloes, the members of the family Loranthaceae are most serious enemies in the Indian forests and orchards (Singh[15]). Kadafbi[8] stated that, *D. falcata* L. f. etting, a well recognised damaging agent to trees, cause more economic loss than any other phanerogamic parasites. Bhattacharya and Dutta[2] made some studies on the anatomical peculiarities of parasitic plants in relation to their hosts; Mukherjee and Bhattacharya[10] observed the evolution and phylogeny of the taxon *Cuscuta.* (Tourn) L.; Cronquist[4], Hutchinson[5], Kanjilal *et al.*[9], Johri and Tiagi[6], Prain[12], Santapau and Patel[13], and many others studied critically