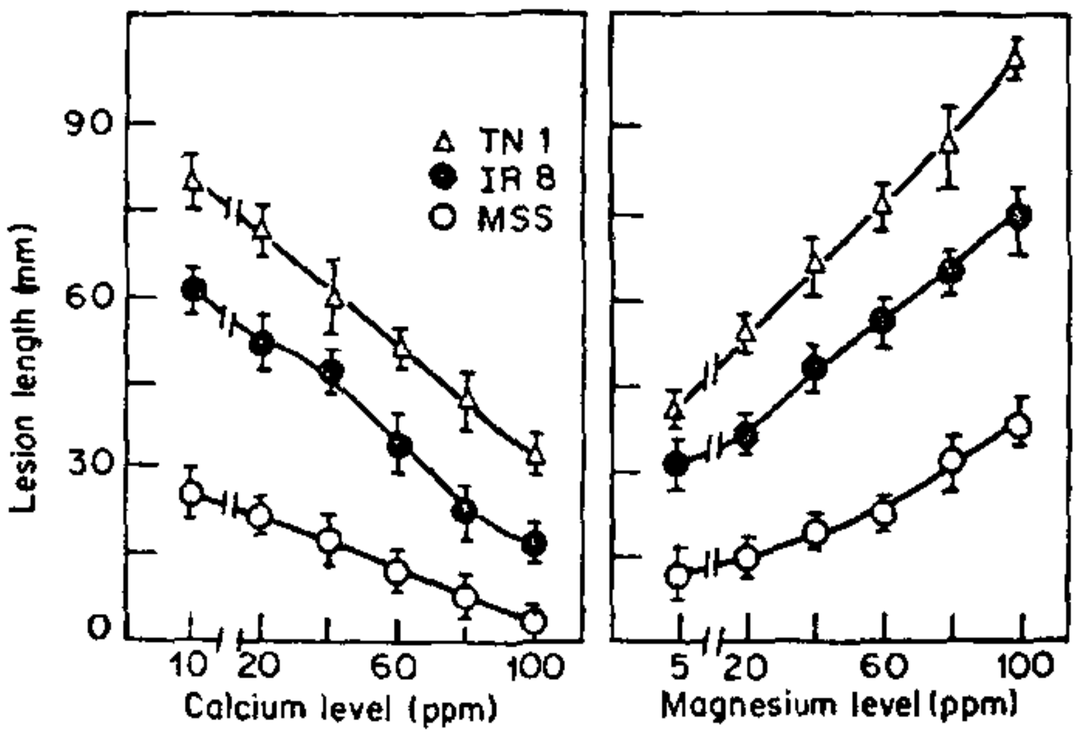

Figure 1. Susceptibility of sensitive (TN 1), intermediate (IR 8) and tolerant (MSS) rice cultivars to bacterial leaf blight at different levels of calcium and agnesium supply. Data represent the lesion length recorded 15 days after inoculation and are averages of 12 measurements. Bars indicate ± standard error.

permeability[1]. Altered membrane permeability is a characteristic early host response to XCO[4], presumably mediated by bacterial toxins and incompatible host-parasite combinations; this may accelerate the movement of water and nutrients to the infected cells, thus favouring the pathogen multiplication[5]. Evidently, in the presence of excess amounts of calcium, the pathogen is unable to disrupt the integrity of the membranes, thus reducing their susceptibility.

Magnesium has been shown earlier to augment the susceptibility of rice plants to bacterial leaf blight[6,7]. Besides, its function in the chlorophyll molecule, magnesium serves as a cofactor in almost all enzymes activating phosphorylation process and plays a vital role throughout the plant metabolism[1]. However, its precise physiological role in disease resistance is not known. Although the effect of calcium and magnesium observed in the present study is common to all the three cultivars tested, their differential reaction to the pathogen at a specific nutrient level might be related to their genetic variation in the uptake and distribution of the plant nutrients coupled with other biochemical factors governing disease resistance and this needs further research. Nevertheless, it is clear that management of this disease by careful soil amelioration in the aforesaid problem soils appears to be a plausible way to minimise the loss caused by it, especially in the absence of potent bactericides and true resistant cultivars for effective disease control.

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IN VITRO EFFICACY OF SOME FUNGICIDES ON INHIBITION OF ASCOSPORE DISCHARGE IN *VENTURIA INAEQUALIS* (COOKE) WINT

G. N. QASBA AND A. M. SHAH
Centre of Research for Development, Kashmir University, Srinagar 190006, India

VENTURIA inaequalis (Cooke) Wint., the causal organism of apple scab, starts its primary infection with two sources. One is previous year's dead scabbed leaves bearing perithecia lying on the ground; the second source is from scab lesions on young shoots and buds[1]. Both the primary sources of infection have been reported from Kashmir Valley[2,3]. The first source is more important because of its widespread occurrence[4].

In order to check the apple scab the routine spraying of various fungicides begins in Kashmir Valley when the apple tree is at green tip stage but without taking into account the phenomenon of ascospore discharge. In this way inoculum of primary source of infection remains unchecked.

Post harvest and orchard floor spray have been advocated [5-7] to reduce the inoculum of primary source of infection or delay the ascospore discharge, as such a delay in discharge of ascospores is expected to provide timely escape to young leaves which are receptive sites for ascospores and would make routine sprays more effective.

Taking into account the epidemic of apple scab on most important commercial cultivar (Red Delicious), the present investigation has been taken up to study the effect of some fungicides on ascospore discharge *in vitro.*

The fungicides used individually and in combinations were Baycor, Difolatan, Delan, Syllit, Bavistin, Dithane M-45 and Baycor + Delan, Delan + Bavistin, Dithane M-45 + Baycor, Baycor + Bavistin, Dithane M-45 + Delan, Baycor + Syllit, Delan + Syllit, Bavistin + Syllit, Difolatan + Syllit, Baycor + Difolatan, Bavistin + Difolatan respectively at 500 ppm concentration.

Overwintered apple leaves of Red Delicious cultivar were collected from orchard floor in the second week of April 1980 from Zakura (Srinagar). To study the effect of fungicides individually and in different combinations experiment was divided into two parts:

Part I (fungicides used individually)

The leaf (2 cm^2 bearing perithecia of *V. inaequalis*) was flattened on filter paper disc which was moistened with 3 ml fungicide solution, lining the inner surface of the lid of the petri plate in such a way that the perithecia were on the side away from the filter paper. One micro-slide smeared with white petroleum jelly was placed in the bottom of petri plate which was then covered with lid in such a fashion that the leaf portion stick to the filter paper remained completely above the smeared micro-slide. In order to prevent the sliding of microslide, it was fixed to the bottom of petri plate by plastic tape. The petri plates were incubated at a constant temperature of 15° C ± 1.

Part II. (fungicides used in combinations)

The leaf portion (1·5 × 4 cm) was taken instead of 2 cm^2 and 1·5 ml of each fungicide solution was used to moisten the filter paper (total 3 ml) and the rest of the procedure was the same as in part I.

For control only distilled water was used. Each set had 3 replicates in both the parts. The microslides were observed after 48 hr for ascospores of *V. inaequalis*. The results are expressed in terms of percentage inhibition of ascopsore discharge with respect to control.

All the six fungicides tested under part I inhibited ascospore discharge when compared with control (table 1). The results of different combinations of fungicides tested under part II are given in table 2.

From the above observations it is clear that fungicides tested have a good potency in inhibiting ascospore discharge in *V. inaequalis*.

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TABLE 1

Effect of some fungicides on ascospore discharge

Fungicide	Mean No. of ascospore discharge	% ascospore discharge with respect to control	% inhibition in ascospore discharge
Bavistin	3·33	31·23	68·77
Syllit	3	28·14	71·86
Difolatan	2·33	21·85	78·15
Delan	2·66	24·95	75·05
Baycor	1·66	15·57	84·43
Dithane M-45	4·66	43·71	56·29
Control	10·66	—	—

TABLE 2

Effect of some fungicide combinations on ascospore discharge

Fungicides	Mean No. of ascospore discharge	% ascospore discharge with respect to control	% inhibition in ascospore discharge
Baycor + Delan	22·6	66·47	33·53
Delan + Bavistin	7·6	22·35	77·64
Dithane M-45 + Baycor	22·3	65·58	34·42
Baycor + Bavistin	5	14·70	85·3
Dithane M-45 + Delan	12	35·29	64·71
Baycor + Syllit	9·3	27·35	72·65
Delan + Syllit	10·3	30·29	69·71
Bavistin + Syllit	4	11·76	88·24
Difolatan + Syllit	7·6	22·35	77·65
Baycor + Difolatan	4·3	12·64	87·36
Bavistin + Difolatan	3	8·82	91·18
Control	34	—	—

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