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## OUTBREAK OF *SCLEROTINA* WHITE MOULD DISEASE IN INDIA

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WHILE surveying the potato growing areas in the Kota region of Rajasthan, drooping and stem-breaking of plants were noted on farmers fields during the second week of January 1988. The disease spread so rapid that within a month the crop was fully damaged and dried. White cottony, fungal growth was visible near broken stem ends with black scleotial bodies measuring from 1 to 5 mm diameter on and inside the stem. It caused watery soft rot of the infected parts. Isolations of the fungus on potato dextrose agar slants yielded white cottony mycelium. Sclerotial bodies then formed near the periphery of the medium. The germination of sclerotia was tested as described by Bedi[1] to get apothecia formation. Each sclerotium produced 5 to 7 stipes bearing funnel-shaped, discoid apothecia of different sizes with asci and ascospores. On the basis of cultural characters and apothecial measurement it has been identified as *Sclerotinia sclerotiorum* (Lib.) de Bary. It was found pathogenic on potato.

Joshi[2] reported that *S. sclerotiorum* causes safflower wilt in India and in host range studies found it pathogenic on potato also. There is no other report of this pathogen pertaining to potato in India and thus poses a matter of great concern owing to its soil-borne nature, very wide host range and the nature of causing extensive damage during cool humid weather.

The disease is known as Sclerotinia white mould (Stalk break) and has been reported from various countries[3–8].

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## FOLIAR APPLICATIONS OF UREA AND ZINC SULPHATE FOR FRUIT DROP CONTROL IN KINNOW MANDARIN

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FRUIT drop is a serious problem in citrus particularly in mandarin. It was reported[1] that in a profusely flowered orange tree, approximately 70–80% flowers and fruit-lets drop in early stages and 16–17% fruits drop during premature and pre-harvest stages. The pre-harvest fruit drop is much more alarming with serious economical significance[2]. Fruit drop has been considered to be a complex phenomenon involving the role of nitrogen and auxins[3]. Urea, zinc sulphate and its combination were therefore

tried to control fruit drop in Kinnow mandarin (*Citrus reticulata*) at this Research Station during 1986–87.

Twenty 15-year-old Kinnow trees growing on Jambhiri (Citrus jambhiri, Osbeck) rootstock and planted 6 × 6 m apart with uniform growth and vigour, were selected for the study. Four treatments, viz. foliar sprays of urea and zinc sulphate at 1% and 0.4% respectively alone and in combination keeping water spray as control were given. Each treatment was replicated five times in randomized block design, keeping a tree as a unit. Foliar applications of the chemicals were given twice a year, i.e. on 1st of April and September. On each tree (replicate), 5 branches were tagged at random for taking fruit count at monthly intervals starting from March 31 (before application of chemicals) to December 31 (a day earlier to fruit harvest).

Table 1 shows that the combined foliar sprays of urea (1.0%) and zinc sulphate (0.4%) proved significantly better than their individual sprays over the control in reducing both premature and pre-harvest fruit drops. Although separate foliar applications of urea and zinc sulphate checked premature fruit drop significantly, the results in respect of pre-harvest fruit drop were insignificant. The individual effect of nitrogen and zinc sulphate in reducing premature drop, might be due to their role in the retardation of formation of abscission layer in the fruit pedicels[3]. Besides, shortage of nitrogen has been considered as one of the reasons for periodic drop of immature fruits[4]. Further, zinc has been known to be necessary for the production of tryptophane, a precursor of auxin, the deficiency of which results in low auxin level causing fruits to drop prematurely[5]. The significant check on economically important pre-harvest fruit drop by the combined foliar sprays of these chemicals can be attributed to the activation of auxins responsible for inhibiting fruit drop by strengthening the fruit pedicels through their synergestic relationship between them[6].

**Table 1** *Effect of sprays of urea and zinc sulphate and their combination on fruit drop*

| Treatment | Premature drop (%)* | Pre-harvest drop (%)** |
|---|---|---|
| Urea (1%) | 10.4 (18.78) | 13.8 (21.81) |
| Zinc sulphate (0.4%) | 9.2 (17.69) | 12.6 (20.52) |
| Urea (1%) + zinc sulphate (0.4%) | 5.2 (13.08) | 2.1 (8.14) |
| Control (water spray) | 23.4 (28.94) | 13.9 (21.87) |
| CD at 5% level | 2.72 | 1.43 |

Figures in parentheses are the values of angular transformation; *Total fruit drop for the months of July, August and September; **Total fruit drop for the months of October, November and December.

The above results suggest that combined foliar sprays of urea (1%) and zinc sulphate (0.4%) twice a year, i.e. in April and September would be most useful to substantially reduce both premature and pre-harvest fruit drops in Kinnow and other citrus crops.

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## ON THE ASSOCIATION OF RICE TUNGRO VIRUS COMPONENTS WITH TUNGRO DISEASE

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TUNGRO is a composite disease caused by two morphologically and serologically unrelated viruses, namely rice tungro spherical virus (RTSV) and rice tungro bacilliform virus (RTBV). Though the rice tungro virus (RTV) components, RTSV and RTBV, have been described as distinct entities[1], further work is required to demonstrate their relationship with each other. The present investigation is one step in that direction.

RTV components from tungro-infected leaves