

EFFICACY OF FOLIO GOLD 440 SC AGAINST DAMPING OFF, BLIGHT AND BLACK SHANK DISEASES IN FCV TOBACCO NURSERIES OF KLS

S. RAMAKRISHNAN, S. S. SREENIVAS AND M. M. SHENOI

ICAR-Central Tobacco Research Institute Research Station, Hunsur-571105, Karnataka, India

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Bio-efficacy of Folio-Gold containing chlorothalonil + metalaxyl M was tested against damping off (*Pythium aphanidermatum*, *P. myriotylum*) and blight & black shank (*Phytophthora parasitica var. nicotianae*) in FCV tobacco nurseries. The molecule effected 78.4 to 88.3 % and 84.1 to 91.9% at 30 and 40 DAS respectively as against 85.4 and 87.8% in recommended Ridomil MZ 72 WP schedule. The blight disease control was in the range of 84.1 to 91.9% in treatments involving Folio Gold at 45 DAS as against 85.9% in recommended schedule. The black shank disease control was in the range of 68.7 to 71.4% as against 71.8% in recommended schedule. The efficacy was on par with recommended schedule involving Ridomil MZ 72 WP. The significant control of diseases reflected on yield of healthy transplants. The yield of total healthy transplants in different treatments involving different dosages ranged from 709 to 747/m² as against 428/m² in untreated control. The economical schedule gave an ICBR of 1:8.4 in bulk evaluation controlling the diseases effectively. The schedule can form as an alternative to Ridomil MZ 72 WP schedule.

INTRODUCTION

Flue-Cured Virginia (FCV) tobacco is a major rainfed commercial crop of export potential in Southern transitional zone of Karnataka. The crop is grown in more than 90 thousand hectares. Seed bed management is an important event for a successful Tobacco crop in the main field. The prevailing weather conditions during March to May months coinciding with the nursery phase tremendously influence spread of many soil-borne fungal diseases like damping off (*Pythium aphanidermatum*, *P. myriotylum*), blight and black shank (*Phytophthora parasitica var. nicotianae*) and anthracnose (*Colletotrichum tabacum*) (Shenoi and

Nagarajan, 2000). Damping-off disease occurs both as pre-emergence and post-emergence stage. Conspicuous symptoms include sudden collapse of young seedlings in patches. Where, as leaf blight and black shank symptoms occur during mid nursery period. Black shank appears as blackened stem at ground level and root, while, blight symptoms include large, circular, water soaked brown lesions often coalesce leading to wet rot of foliage leading to death of transplant. These two diseases are critical if effective control measures are imposed.

Though effective management schedules including chemical (Shenoi and Wajid, 1982) and integrated approaches are available (Abdul Wajid et al., 1995), efforts are being made constantly to evaluate new class of fungicides for developing efficient strategies to avoid development of resistance by the pathogens. The present communication is on the evaluation of Folio Gold containing chlorothalonil (33.1%) + metalaxyl M (3.3%) against damping off, blight and black shank diseases. The results highlight the efficacy of the Folio Gold and cost economics of the identified schedule to manage the diseases in FCV tobacco nurseries of KLS.

MATERIALS AND METHODS

The present study was conducted at CTRI Research station, Hunsur for two years in a replicated experimentation during 2007-2009 and subsequent confirmation trials during 2010-2012. Bulk evaluation of the molecule was carried out during 2017-18 to work out cost-benefit ratio of the molecule and to derive a cost-effective schedule for the management of above diseases in FCV tobacco nurseries of Karnataka

Key Words: Folio-Gold, FCV tobacco nursery, Damping off, Blight and Blank Shank.

Table 1: Bio-efficacy of Folio Gold against damping off, blight and black shank diseases in FCV tobacco nursery (Pooled)

| S.N | Treatment details | Average Germination at 15 DAS per 100 sq.cm | % Damping off at 30 DAS | | % Damping off at 40 DAS | | %Damping off + Blight at 45 DAS | | % Black shank | | Total healthy transplants per sq.m |
|-----|------------------------------------------------------------------------------|---------------------------------------------|-------------------------|------|-------------------------|------|---------------------------------|------|-----------------|------|------------------------------------|
| | | | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | |
| | | | | | | | | | | | |
| 1. | FOLIO GOLD @ 0.1% pre-sowing drench + FOLIAR spray at 30 & 45 DAS | 22.5 | 3.7 (1.36) | 78.4 | 4.4 (1.93) | 80.0 | 5.3 (2.76) | 84.1 | 7.1 (4.84) | 68.7 | 709 |
| 2. | FOLIO GOLD @ 0.15% pre-sowing drench + spray at 30 & 45 DAS | 23.6 | 3.5 (1.24) | 79.4 | 3.3 (1.04) | 85.1 | 4.4 (1.90) | 86.8 | 6.6 (4.19) | 70.9 | 719 |
| 3. | FOLIO GOLD @ 0.2% pre-sowing drench + spray at 30 & 45 DAS | 23.1 | 2.0 (0.41) | 88.3 | 2.6 (0.63) | 88.2 | 3.8 (1.39) | 88.6 | 6.9 (4.63) | 69.6 | 738 |
| 4 | FOLIO GOLD @ 0.4% pre-sowing drench + spray at 30 & 45 DAS | 22.5 | 2.2 (0.49) | 87.1 | 2.7 (0.74) | 87.8 | 3.7 (1.33) | 88.9 | 6.4 (3.94) | 71.8 | 747 |
| 5 | FOLIO GOLD @ 0.8% pre-sowing drench + spray at 30 & 45 DAS | 23.0 | 2.2 (0.41) | 87.1 | 2.0 (0.41) | 91.0 | 2.7 (0.74) | 91.9 | 6.5 (4.08) | 71.4 | 741 |
| 6 | KAVACH @ 0.15% pre-sowing drench + spray at 30 & 45 DAS | 22.6 | 3.1 (0.91) | 81.9 | 12.2 (14.1) | 44.8 | 19.0 (31.53) | 42.9 | 13.6 (17.24) | 40.1 | 568 |
| 7 | KOCIDE 101 @ 0.2% as soil drench + 0.2% FOLIAR spray at 25 and 35 DAS | 22.8 | 3.4 (1.18) | 80.1 | 6.1 (3.61) | 72.4 | 10.6 (10.78) | 68.2 | 7.3 (5.17) | 67.8 | 656 |
| 8 | KOCIDE 101 @ 0.4% as soil drench + 0.2% FOLIAR spray at 25 and 35 DAS | 23.8 | 3.8 (1.39) | 77.8 | 3.0 (0.87) | 86.4 | 4.1 (1.62) | 87.7 | 7.0 (4.71) | 69.2 | 693 |
| 9 | RIDOMIL MZ 72 WP @ 0.1% as soil drench + FOLIAR spray@ 0.2% at 30 and 45 DAS | 22.7 | 2.5 (0.63) | 85.4 | 2.7 (0.74) | 87.8 | 4.7 (2.15) | 85.9 | 6.4 (3.97) | 71.8 | 741 |
| 10. | Control (Untreated) | 22.8 | 17.1 (26.29) | - | 22.1 (41.0) | - | 33.3 (75.08) | - | 22.7 (42.78) | - | 428 |
| | S.E.m | 1.44 | 0.81 | - | 1.35 | - | 2.39 | - | 0.53 | - | 34.13 |
| | CD at 5% | NS | 2.26 | - | 3.73 | - | 6.64 | - | 1.46 | - | 94.60 |
| | CV% | 19.54 | 68.65 | - | 80.73 | - | 70.62 | - | 22.66 | - | 12.33 |
| | Seasons mean | 1 | 5.889 | - | 6.85 | - | 9.14 | - | 8.94 | - | 576 |
| | 2 | 25.32 | 2.801 | - | 5.38 | - | 9.17 | - | 9.12 | - | 772 |
| | S.E.m | 0.71 | 0.47 | - | 0.78 | - | 1.02 | - | 0.32 | - | 13.14 |
| | CD at 5% | 2.45 | 1.63 | - | NS | - | NS | - | NS | - | 45.47 |
| | CV% | 17.81 | 52.95 | - | 62.29 | - | 73.96 | - | 16.50 | - | 14.32 |
| | S.E.m | 2.04 | 1.15 | - | 1.90 | - | 3.39 | - | 0.75 | - | 48.26 |
| | CD at 5% | NS | 3.19 | - | 5.28 | - | 9.39 | - | NS | - | NS |

*Figures in parenthesis are arc sin transformed values; 1= Original mean; 2= % control over check

as an alternative to existing chemical schedule of Ridomil Gold. Fungicides Folio Gold and Ridomil MZ 72 WP were applied to the nursery as soil drench @ 500 ml/m² and spray drench @ 100/m², while copper hydroxide 77% (Kocide-101) was applied @ 1.0 l/m². Folio Gold was tested at different dosages ranging from 0.1 to 0.8%. The nursery was raised by following recommended package of practices (Shenoi, 1998). Regular observations on the diseases, damping off, blight and black shank were made, while healthy transplant counts were made at each pulling. The data from the two years study was pooled to draw valid conclusions.

RESULTS AND DISCUSSION

The results of the pooled data of the study conducted for two seasons suggested good efficacy of the molecule in controlling the diseases (Table 1). No phyto-toxicity was noticed even at higher dosage when tested as pre-sowing soil drench. The fungicide effectively controlled damping off, blight and black shank diseases when tested at different doses. The treatments were significantly superior over check in controlling the disease and were on par with recommended Ridomil MZ 72 WP. The damping off disease control ranged from 78.4 to 88.3 % and 84.1 to 91.9% at 30 and 40 DAS respectively as against 85.4 and 87.8% in recommended Ridomil MZ 72 WP schedule. The treatments were non-significant among them, and were on par with recommended schedule. The

blight disease control was in the range of 84.1 to 91.9% in treatments involving Folio Gold at 45 DAS as against 85.9% in recommended schedule. The black shank disease control was in the range of 68.7 to 71.4% as against 71.8% in recommended schedule. The significant control of damping off, blight and black shank diseases reflected on yield of healthy transplants. The yield of total healthy transplants in different treatments ranged from 709 to 747/m² as against 428/m² in untreated control. From the study it is concluded that the molecule, Folio gold containing chlorothalonil + metalaxyl M is an effective molecule against damping off, blight and black shank diseases in tobacco nursery and on par with recommended Ridomil MZ 72 WP. Fungicide Kavach containing chlorothalonil alone is not effective suggesting the synergic effect of metalaxyl M when fortified as in the case of Folio Gold.

Bulk evaluation of the formulation carried out with an aim to alternate the schedule of Ridomil MZ72WP also, gave similar control and resulted in higher yield of healthy transplants. The molecule was evaluated in a bulk nursery raised with variety Kanchan by following all agronomical practices. The results were compared with an untreated nursery raised with normal agronomical practices and no chemical management. The schedule gave an ICBR of 1:8.4. It is concluded from the study that an economical schedule comprising Folio Gold @ 0.2% pre-sowing drench + foliar spray at 30 & 45 DAS is good enough

Table 2: Cost benefit ratio of promising Folio Gold schedule against damping off, blight and black shank diseases in FCV tobacco nursery

| Inputs/outcome | Conventional nursery (Un-treated check) | Chemical Control with Folio Gold 440SC |
|-------------------------------------------------------------|--------------------------------------------|-------------------------------------------|
| Cost of raising nursery per 100sq.m (Rs/-) | 3500/- | 3500/- |
| Additional cost over check (Rs/-) | - | 300/- |
| Number of healthy transplants per 100 sq.m | 48200 | 70800 |
| No. excess transplants over check | - | 22600 |
| Additional revenue over check @ 125/1000 transplants (Rs/-) | - | 2825 |
| Net revenue over check (Rs/-) | - | 2525 |
| ICBR of the schedule | - | 1:8.4 |

to manage damping off, blight and black shank diseases in FCV tobacco nurseries of KLS.

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