



Efficacy of Nativo 75 WG against blister blight in tea [*Camellia sinensis* (L.) O. Kuntze]

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Received: 15.03. 2015; Accepted: 14.05.2015

Abstract

Seven fungicidal treatments viz. Nativo (trifloxystrobin 25% + tebuconazole 50%) 75 WG at 75, 100 and 125 g/ha, Contaf (hexaconazole) 5 EC + Calixin (tridemorph) 80 EC at 100 + 90 ml/ha, trifloxystrobin 50 WG at 625 g/ha, Folicur (tebuconazole) 250 EW at 250 ml/ha and untreated control were evaluated during 2010 and 2011 at Palampur against blister blight in tea (*Exobasidium vexans*). The two years pooled data showed that the test fungicide Nativo 75 WG at 125 g/ha was effective against blister blight to yield 60.0% control. This was statistically significant to its constituents Folicur 250 EW and trifloxystrobin 50 WG at recommended doses. Folicur 250 EW at 250 ml/ha yielded 50.3% disease control whereas, trifloxystrobin 50 WG at 625 g/ha resulted in 37.0% disease control. Folicur 250 EW at 250 ml/ha was statistically at par with Contaf 5 EC + Calixin 80 EC at 100 + 90 g/ha to yield 47.4% disease control. No chlorosis, necrosis and epinasty were observed on juvenile pluckable shoots even at higher concentrations of the test fungicide. Hence, Nativo 75 WG at 125 g/ha was recommended against blister blight of tea.

Key words: Blister blight, fungicidal, Nativo, incidence, severity, tea.

Blister blight caused by an obligate fungus *Exobasidium vexans* Masee is the major foliar disease of tea [*Camellia sinensis* (L.) O. Kuntze] which leads to enormous crop loss and quality deterioration of made tea (Baby et al. 1998). The slopy land of Kangra valley in the Dhauladhar range of Himachal Pradesh have an acidic soil formed due to high rainfall especially during the monsoon season (Mid - June to Mid -September) is highly suitable for tea cultivation. But the cool-humid climate favours the incidence of the disease. With the onset of rainy season from July to September, the disease starts appearing as whitish blister of basidiospore mass (Plate 1) on pluckable shoots of self grown tea seedlings under mother tea bushes to serve as initial foci for further disease spread. The disease, being polycyclic in nature, assumes epiphytotic conditions within few days to cause huge crop loss. The disease perpetuates in the form of viable basidiospore in the necrotic lesions (Sugha 1997) during dormant season. The disease can be effectively controlled by copper. The systemic tridemorphs

and triazoles group of fungicides have been found to be effective against the disease (Baby 2002; Thakur and Thakur 2005). However, NATIVO 75 WG—a co-ordinate fungicide of trifloxystrobin (meso-systemic) and tebuconazole (systemic) may be more effective against blister blight of tea since the disease is meso-systemic. Therefore, its bioefficacy was tested against *Exobasidium vexans* in tea.

The field trial was conducted in a permanent layout during the rainy season of 2010 and 2011 at Department of Tea Husbandry and Technology, CSKHPKV, Palampur to study the bioefficacy of NATIVO 75 WG against blister blight in tea. Seven treatments viz. NATIVO (trifloxystrobin 25% + tebuconazole 50%) 75 WG at 75, 100 and 125 g/ha (18.75 + 37.5, 25 + 50 and 31.25 + 62.5 g ai/ha, respectively), Contaf (hexaconazole) 5 EC + Calixin (tridemorph) 80 EC at 100 + 90 ml/ha, trifloxystrobin 50 WG at 62.5 g/ha, Folicur (tebuconazole) 250 EW at 250 ml/ha and untreated control were tested in a randomized block design with three replications.

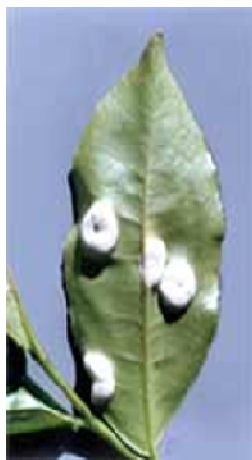


Plate 1. Basidiospore of *Exobasidium vexans* in tea

Each plot consisted of having 25 well established tea bushes (about 20 years old) in square. Each plot was surrounded by a buffer of two border rows to avoid drift of fungicidal spray. Three sprays of NATIVO 75 WG at 15 days interval were given after plucking round, starting with the appearance of the disease (mid August) to the disease lasts (September end). Five bushes were randomly selected in each plot and per cent disease incidence and disease severity in each plucking round were worked out as follows:

$$\text{Disease incidence (\%)} = \frac{\text{Number of diseased shoots}}{\text{Total number of shoots}} \times 100.$$

$$\text{Disease severity (\%)} = \frac{\text{Size of sporulating blisters}}{\text{Area of the shoot}} \times 100$$

In the present investigation shoot means two leaves along with a bud. Twenty randomly selected disease shoots from plucked lots were assessed for disease severity. The data were pooled and the treatments were compared at 5% level of significance. The percent data were transformed to arcsine transformation. Data on phytotoxicity symptoms like chlorosis, necrosis and epinasty on juvenile pluckable shoots of tea at different concentrations of the fungicide were recorded on 1, 3, 5 and 7 days after sprays.

The fungicidal treatments brought about significant variation in the incidence of blister blight in tea (Table 1.). All the treatments were significantly superior to the untreated control in reducing blister blight incidence. Nativo 75 WG at 125 g/ha remaining at par with Folicur 250 EW at 250 ml/ha and Contaf 5EC + Calixin 80 EC at 100 + 90 ml/ha resulted in significantly lower incidence of blister blight over other treatments. Based on disease incidence Nativo 75 WG at 125 g/ha had highest disease control of 70.1%. This was followed by Contaf 5EC + Calixin 80EC.

The fungicidal treatments also resulted in significant variation in disease severity as well. All treatments were

Table 1. Efficacy of Nativo 75 WG against blister blight of tea

Treatment	Dose (g or ml/ ha)	Blister blight (<i>Exobasidium vexans</i>)							
		Disease incidence		Mean	%	Disease severity		Mean	% Dis- ease control
		2010	2011			2010	2011		
Nativo 75 WG	75	13.2 (21.30)	15.1 (22.8)	14.1 (22.0)	47.3	10.4 (18.81)	10.4 (18.8)	10.4 (18.8)	22.9
Nativo 75 WG	100	12.5 (20.70)	14.9 (22.7)	13.7 (21.7)	48.8	9.9 (18.34)	10.7 (19.0)	10.3 (18.7)	23.7
Nativo 75 WG	125	8.0 (16.43)	8.1 (16.5)	8.0 (16.4)	70.1	4.9 (12.79)	6.0 (14.1)	5.4 (13.4)	60.0
Trifloxystrobin 50 WG	625	12.2 (20.44)	12.1 (20.3)	12.1 (20.3)	54.8	7.6 (16.0)	9.4 (17.8)	8.5 (16.9)	37.0
Folicur 250 EW	250	9.0 (17.46)	9.4 (17.8)	9.2 (17.6)	65.6	5.9 (14.06)	7.5 (15.8)	6.7 (15.0)	50.3
Contaf 5 EC + Calixin 80 EC	100 + 90	9.5 (17.95)	10.4 (18.8)	9.9 (18.3)	63.0	6.4 (14.65)	7.9 (16.3)	7.1 (15.4)	47.4
Control		26.1 (30.72)	27.6 (31.6)	26.8 (31.2)	-	13.6 (21.64)	13.4 (21.4)	13.5 (21.5)	-
LSD (P=0.05)	-	1.88	1.73			0.62	1.63		

The data were transformed to arcsine transformation. Figures in parentheses are the means of original % disease incidence/severity.

superior to untreated check in reducing disease severity.

The two years pooled data (Table 1) reveal that the test fungicide Nativo 75 WG was found to be effective at 125 g/ha to yield 60.0% reduction in disease severity over control and was found statistically superior to its constituents Folicur 250 EW and trifloxystrobin 50 WG at recommended doses. Folicur 250 EW at 250 ml/ha yielded 50.3% disease control, whereas, trifloxystrobin 50 WG at 625 g/ha resulted in 37.0% disease control. Folicur 250 EW at 250 ml/ha was statistically at par with Contaf 5EC + Calixin 80 EC at recommended dose. The results were comparable with the studies carried out by various workers (Venkataram 1974; Thakur and Thakur 2005; Thakur *et al.* 2009). Nativo 75 WG at lower concentrations (75 and 100 g/ha) was found to be least effective to keep the disease pressure below 50%.

No phytotoxicity symptoms (Table 2) such as chlorosis, necrosis and epinasty were observed on juvenile pluckable shoots even at higher concentrations of the fungicide.

Table 2. Phytotoxicity of Nativo 75 WG in tea

Treatment	Dose (g or ml / ha)	Chloro- sis	Necro- sis	Epi- nasty
Nativo 75 WG	100	0	0	0
Nativo 75 WG	125	0	0	0
Nativo 75 WG	150	0	0	0

The study conclusively inferred that Nativo 75 WG at 125 g/ha was a promising fungicide to reduce the disease upto 60.0%. It was statistically significant to its constituents Folicur 250 EW and Trifloxystrobin 50 WG at recommended doses. Hence, Nativo 75 WG - a coordinate fungicide of trifloxystrobin (meso-systemic) and tebuconazole (systemic) at 125 g/ha is recommended against blister blight of tea to keep disease pressure below 60.0%.

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