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# Scheduling of fungicidal sprays for the management of powdery mildew of cumin

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**ABSTRACT**

**An experiment was conducted during *rabi* season in 2007-08 and 2008-09 to find out appropriate Scheduling of fungicidal sprays for the management of powdery mildew of cumin. Significant differences were observed amongst various fungicidal spray schedules for disease intensity, yield, volatile oil and 1000-seed weight. The treatments with two sprays of difenaconazole @ 0.05 per cent and two sprays of wettable sulphur @ 0.2 per cent were at par with three sprays of difenaconazole @ 0.05 per cent and wettable sulphur @ 0.2 per cent with respect to per cent disease intensity, seed and oil yield and 1000-seed weight. Thus, two sprays of difenaconazole (0.05 %) proved most effective in reducing disease and recorded 19.05 per cent disease intensity with higher reduction in disease (67.24 %) over control and also gave higher yield (522.8 kg h $^{-1}$), volatile oil (4.11 %) and 1000-seed weight (2.62 g). But on the basis of economic analysis, two sprays of wettable sulphur @ 0.2 per cent from disease onset and thereafter at an interval of 17 days with the higher profit (Net ICBR 1:10.86) was observed best to two sprays difenaconazole @ 0.05 per cent (Net ICBR 1:0.57) with respect to disease intensity (21.02 %) and overall yield followed by three sprays of of wettable sulphur @ 0.2 per cent (Net ICBR 1:7.18), two sprays of hexaconazole @ 0.05 per cent (Net ICBR 1:6.64), two dusting of sulphur (Net ICBR 1:6.06) and mancozeb 0.25 per cent.**

**Key words:** Cumin, Powdery mildew, Scheduling, Volatile oil and yield.

## Lkkjka'k

o"kZ 2007&08 rFkk 2008&09 dh nkjku jch esa thjs dh Qly esa pw.kk vkflrk jksx dh jksdFkke dh fy, QQnhuk'kd fNMdko dk le;c)u gyr ,d iz;kx lpkfyr fd;k x;kA dbZ QQnhuk'kdksa dh le;c) fNMdkoksa esa dqN egRoiw.kZ vUrj ns[kk x;k] jksx dh rhozrk] cht mit] ok"Ik'khy rsy dh ek=k ,oa 1000 chtksa dk Hkkjk A ,d mipkj esa MkbQqukdkuktkSy @0-05 izfr'kr dh nks fNMdko rFkk nks nks fNMdko xa/kd oVsVcy ikmMj @ 0-2 izfr'kr leku ik;s x;s MkbQqukdkuktkSy @ 0-05 izfr'kr rFkk oVsVcy lYQj @ 0-2 izfr'kr dh rhu fNMdkoksa dh] ;s vUrj jksx dh rhozrk] cht mit] rsy mit vkSj 1000 cht Hkkj dh lanHkZ esa ns[kk x;sA bl izdkj MkbQqukdkuktkSy 0-05 izfr'kr dh nks fNMdko chekjh de djus esa vf/kd izHkkoh ik;s x;s] blesa chekjh rhozrk 19-05 izfr'kr ik;h xbZ lkFk gh chekjh esa Hkkjh deh gqbZ ,oa dVksyh dh ctk; vf/kd mit Hkh izkIr gqbZA ijUrq vkfFkZd fo'ys"k.k ds vk/kkj ij] oVsVoy lYQj dh nks fNMdko @ 0-2 izfr'kr chekjh vkuk ij rFkk 17 fnu dh vUrj ls mit esa T;knk Qk;nk ns[kk x;k ¼'k) [kpZ Qly ykHk vuqikr 1¼ 10-86½] tks MkbQqukdkuktkSy dh nks fNMdko @ 0-05 izfr'kr ¼'k) [kpZ Qly ykHk vuqikr 1¼ 0-57½] chekjh rhozrk ¼21-02 izfr'kr½ vkSj dqy mit dh lanHkZ esa vf/kd FkkA bldsa ckn rhu fNMdko oVsVcy lYQj @ 0-2 izfr'kr ¼'k) [kpZ Qly ykHk vuqikr 1¼7-18½] nks fNMdko gDtkdkuktkSy @ 0-05 izfr'kr ¼'k) [kpZ Qly ykHk vuqikr 1¼6-64½] nks lYQj cjdko ¼'k) [kpZ Qly ykHk vuqikr1¼6-06½ rFkk eSdkstsc 0-25 izfr'kr ik;k x;kA

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## INTRODUCTION

India is one of the largest producer, consumer and exporter of seed spices (Peter *et al*., 9). Cumin *(Cuminum cyminum* L.) is an important seed spice crop among the 20 seed spices grown in India. Cumin seeds are used in perfumery, cookery, as curry powder, for flavouring soups, pickles, cheese and for seasoning breads and cakes and as an indigenous medicine and have been considered stimulative, carminative and astringenative. Extensive cultivation of cumin is confined to the states of Gujarat and Rajasthan. Among all fungal diseases of cumin, powdery mildew caused by *Erysiphe polygoni* DC. is the most destructive disease. The disease is widespread in all the cumin growing areas and cause up to 50 per cent yield losses under favourable weather conditions besides reducing the market value of seeds (Lodha *et al.,6*). Powdery mildew is known to occur in Bombay Province as early as 1921(Burns,1) and is now reported to occur in all the tracts where cumin is grown extensively. On an average, crop loss of about 50 per cent was reported if the disease occurred during flowering stage; however, a minimum of 10-15 per cent yield loss occurred even if the disease appeared at later stage of seed formation (Chattopadhyay, 2). Total crop loss may often occur if the disease appears in epiphytotic form (Uppal and Desai, 10).Besides yield reduction, the colour and quality of infected seeds also affects its marketability. Powdery mildew is an endemic disease in cumin growing areas of Gujarat and now a days it is the most significant production constraint in states of Gujarat and Rajasthan. The information on appropriate scheduling of fungicidal sprays for the management of powdery mildew of cumin is very scanty. Hence, attempts were made to generate information on scheduling of fungicidal sprays for the management of powdery mildew of cumin.

## MATERIALS AND METHODS

The field study was conducted in randomized block design (RBD) in following fifteen different spray schedules with three replications at Centre for Research on Seed Spices, Jagudan, Mehsana, Gujarat in *rabi* of 2007-08 and 2008-09.

1. Wettable sulphur 80 WP 0.2% 3 sprays*** **(WS-3S)**
2. Wettable sulphur 80 WP 0.2% 2 sprays** **(WS-2S)**
3. Wettable sulphur 80 WP 0.2% 1 spray* **(WS-1S)**
4. Hexaconazole 25 EC 0.05% 3 sprays*** **(Hx-3S)**
5. Hexaconazole 25 EC 0.05% 2 sprays** **(Hx-2S)**
6. Hexaconazole 25 EC 0.05% 1 spray* **(Hx-1S)**
7. Difenaconazole 25 EC 0.05% 3 sprays*** **(Df-3S)**
8. Difenaconazole 25 EC 0.05% 2 sprays** **(Df-2S)**
9. Difenaconazole 25 EC 0.05% 1 spray* **(Df-1S)**
10. Sulphur dust (300 mesh) @ 25kg/ha 3 applications*** **(SD-3)**
11. Sulphur dust (300 mesh) @ 25kg/ha 2 applications** **(SD-2)**
12. Sulphur dust (300 mesh) @ 25kg/ha 1 application* **(SD-1)**
13. Mancozeb 75 WP 0.2 per cent 4 sprays # **(M)**
14. Control (Water spray) **(C-WS)**
15. Control (No spray) **(C-NS)**

Note—

*** *First spray at initiation of disease and remaining two sprays at an interval of 12 days*

** *First spray at initiation of disease and second at 17 days after first spray*

* *Single spray at initiation of disease*

\# *at 40, 50, 60 and 70 days after sowing*

Cumin was sown by broadcasting method in 4.0 m X 3.0 m plot size during second week of November using crop variety GC-4 (wilt resistant variety). Recommended agronomic practices were followed for whole experiment. The observations on the intensity of powdery mildew was recorded after each spray from 20 plants randomly selected from each plot using 0-4 scale . Based on these observations, per cent disease intensity (PDI) of the disease was worked out. The seed yield, volatile oil and 1000-seed weight from individual plots were also recorded.

## RESULTS AND DISCUSSION

Significant differences were observed amongst various fungicidal spray schedules for disease intensity, yield, volatile oil and 1000-seed weight (Table 1 to 3, Plate 1 and Fig.1). On an average the spray treatment either with three sprays of difenaconazole @ 0.05 per cent or wettable sulphur @ 0.2 per cent was promising for getting higher yield (558.0 and 536.5 kg/ha, respectively) with less disease intensity (16.21 and 19.02 per cent, respectively). The volatile oil and 1000-seed weight was also recorded maximum in these treatments. These treatments were followed by two sprays of difenaconazole and wettable sulphur. However, treatments with two sprays difenaconazole and two sprays of wettable sulphur were at par with three sprays of difenaconazole and wettable sulphur with respect to per cent disease intensity, seed as well as

**Table 1.** Effect of different spray schedules of fungicides on powdery mildew intensity

| Sr. No. | Treatments | 2007-08 | | 2008-09 | | Pooled | |
|---|---|---|---|---|---|---|---|
| | | PDI | per cent decrease in PDI | PDI | per cent decrease in PDI | PDI | per cent decrease in PDI |
| 1 | Wettable sulphur 0.2% 3 sprays (WS-3S) | 18.20 (9.81)* | 68.93 | 19.84 (11.63)* | 65.63 | 19.02 (10.72)* | 67.29 |
| 2 | Wettable sulphur 0.2% 2 sprays (WS-2S) | 19.66 (11.44) | 66.43 | 22.07 (14.23) | 61.25 | 21.02 (13.03) | 63.85 |
| 3 | Wettable sulphur 0.2% 1 spray (WS-1S) | 34.09 (31.50) | 41.80 | 35.08 (33.13) | 39.23 | 34.59 (32.32) | 40.52 |
| 4 | Hexaconazole 0.05% 3 sprays (Hx-3S) | 22.36 (14.56) | 61.82 | 22.06 (14.19) | 61.79 | 22.21 (14.38) | 61.81 |
| 5 | Hexaconazole 0.05% 2 sprays (Hx-2S) | 25.64 (18.81) | 56.22 | 26.18 (19.56) | 54.65 | 25.91 (19.19) | 55.44 |
| 6 | Hexaconazole 0.05% 1 spray (Hx-1S) | 32.54 (29.00) | 44.44 | 33.78 (31.00) | 41.49 | 33.16 (30.00) | 42.98 |
| 7 | Difenaconazole 0.05% 3 sprays (Df-3S) | 14.13 (6.00) | 75.88 | 18.59 (9.94) | 68.32 | 16.21 (7.97) | 72.12 |
| 8 | Difenaconazole 0.05% 2 sprays (Df-2S) | 17.96 (9.49) | 69.23 | 20.07 (11.88) | 65.23 | 19.05 (10.78) | 67.24 |
| 9 | Difenaconazole 0.05% 1 spray (Df-1S) | 27.71 (21.75) | 52.69 | 29.02 (23.63) | 49.73 | 28.36 (22.69) | 51.23 |
| 10 | Sulphur dust (25kg/ha) 3 applications (SD-3S) | 23.45 (15.94) | 59.96 | 24.25 (16.94) | 57.99 | 23.85 (16.44) | 58.99 |
| 11 | Sulphur dust (25kg/ha) 2 applications (SD-2S) | 27.35 (21.19) | 53.30 | 27.92 (22.00) | 51.64 | 27.64 (21.59) | 52.47 |
| 12 | Sulphur dust (25kg/ha) 1 application (SD-1S) | 37.52 (37.13) | 35.94 | 38.47 (38.75) | 33.36 | 37.99 (37.94) | 34.67 |
| 13 | Mancozeb 0.25% 4 sprays (M) | 48.84 (56.69) | 16.61 | 48.03 (55.31) | 16.80 | 48.43 (56.00) | 16.72 |
| 14 | Control (Water spray) (WS) | 57.97 (71.86) | 1.02 | 56.64 (69.75) | 1.89 | 57.31 (70.81) | 1.44 |
| 15 | Control (No spray) (NS) | 58.57 (72.38) | - | 57.73 (71.38) | - | 58.15 (71.88) | - |
| | S.Em. ± | 1.34 | - | 1.23 | - | 0.88 | - |
| | C.D. at 5% | 3.84 | - | 3.50 | - | 2.49 | - |
| | Y x T | - | - | - | - | NS | - |
| | C.V.% | 8.65 | - | 7.67 | - | 8.16 | - |

* Figures in parentheses are transformed values

**Table 2.** Effect of different spray schedules of fungicides on seed yield of cumin

| Sr. No. | Treatments | 2007-08 | | 2008-09 | | Pooled | |
|---|---|---|---|---|---|---|---|
| | | Seed yield (kg ha$^{-1}$) | Per cent increase in yield | Seed yield (kg ha$^{-1}$) | Per cent increase in yield | Seed yield (kg ha-$^{1}$) | Per cent increase in yield |
| 1 | Wettable sulphur (0.2%) 3 sprays (WS-3S) | 528.9 | 40.9 | 544.2 | 36.7 | 536.5 | 38.8 |
| 2 | Wettable sulphur (0.2%) 2 sprays (WS-2S) | 514.2 | 39.2 | 531.5 | 35.2 | 522.8 | 37.2 |
| 3 | Wettable sulphur (0.2%) 1 spray (WS-1S) | 391.5 | 20.2 | 381.1 | 9.6 | 386.3 | 15.0 |
| 4 | Hexaconazole (0.05%) 3 sprays (Hx-3S) | 492.4 | 36.5 | 542.4 | 36.5 | 517.4 | 36.5 |
| 5 | Hexaconazole (0.05%) 2 sprays (Hx-2S) | 450.0 | 30.6 | 525.7 | 34.5 | 487.8 | 32.7 |
| 6 | Hexaconazole (0.05%) 1 spray (Hx-1S) | 388.9 | 19.7 | 380.6 | 9.5 | 384.7 | 14.6 |
| 7 | Difenaconazole (0.05%) 3 sprays (Df-3S) | 548.6 | 43.0 | 567.4 | 39.3 | 558.0 | 41.1 |
| 8 | Difenaconazole (0.05%) 2 sprays (Df-2S) | 523.3 | 40.3 | 530.3 | 35.1 | 526.9 | 37.7 |
| 9 | Difenaconazole (0.05%) 1 spray (Df-1S) | 454.2 | 31.2 | 402.1 | 14.4 | 428.1 | 23.3 |
| 10 | Sulphur dust (25 kg/ha) 3 applications (SD-3S) | 413.9 | 24.5 | 470.8 | 26.9 | 442.4 | 25.8 |
| 11 | Sulphur dust (25 kg/ha) 2 applications (SD-2S) | 404.0 | 22.7 | 417.9 | 17.6 | 410.9 | 20.1 |
| 12 | Sulphur dust (25 kg/ha) 1 application (SD-1S) | 340.7 | 8.3 | 340.0 | - | 340.3 | 3.5 |
| 13 | Mancozeb (0.25%) 4 sprays (M) | 337.8 | 7.5 | 338.5 | - | 338.2 | 2.9 |
| 14 | Control (Water spray) (WS) | 321.9 | 2.9 | 342.1 | - | 332.0 | 1.1 |
| 15 | Control (No spray) (NS) | 312.5 | - | 344.4 | - | 328.5 | - |
| | S.Em. ± | 18.74 | - | 16.30 | - | 12.80 | - |
| | C.D. at 5% | 52.70 | - | 46.53 | - | 36.01 | - |
| | Y x T | - | - | - | - | NS | - |
| | C.V.% | 9.51 | - | 8.25 | - | 8.88 | - |

**Table 3.** Effect of different spray schedules of fungicides on volatile oil and 1000-seed weight of cumin

| Sr. No. | Treatments | 2007-08 | | 2008-09 | | Pooled | |
|---|---|---|---|---|---|---|---|
| | | Volatile oil (%) | 1000-seed weight (g) | Volatile oil (per cent) | 1000-seed weight (g) | Volatile oil (%) | 1000-seed weight (g) |
| 1 | Wettable sulphur (0.2%) 3 sprays (WS-3S) | 4.25$^{a}$ | 2.77$^{ab}$ | 4.15$^{ab}$ | 2.76$^{ab}$ | 4.20$^{ab}$ | 2.77$^{ab}$ |
| 2 | Wettable sulphur (0.2%) 2 sprays (WS-2S) | 4.15$^{ab}$ | 2.69$^{bc}$ | 4.08$^{abc}$ | 2.68$^{b}$ | 4.11$^{bc}$ | 2.59$^{cd}$ |
| 3 | Wettable sulphur (0.2%) 1 spray (WS-1S) | 3.85$^{cde}$ | 2.34$^{d}$ | 3.73$^{de}$ | 2.31$^{d}$ | 3.79$^{ef}$ | 2.32$^{ef}$ |
| 4 | Hexaconazole (0.05%) 3 sprays (Hx-3S) | 4.15$^{ab}$ | 2.76$^{ab}$ | 4.08$^{abc}$ | 2.75$^{ab}$ | 4.11$^{bc}$ | 2.75$^{b}$ |
| 5 | Hexaconazole (0.05%) 2 sprays (Hx-2S) | 3.95b$^{cd}$ | 2.56$^{c}$ | 3.83$^{cd}$ | 2.54$^{c}$ | 3.89$^{de}$ | 2.55$^{d}$ |
| 6 | Hexaconazole (0.05%) 1 spray (Hx-1S) | 3.68$^{e}$ | 2.31$^{de}$ | 3.55$^{ef}$ | 2.28$^{d}$ | 3.61$^{g}$ | 2.29$^{ef}$ |
| 7 | Difenaconazole (0.05%) 3 sprays (Df-3S) | 4.32$^{a}$ | 2.83$^{a}$ | 4.25$^{a}$ | 2.81$^{a}$ | 4.30$^{a}$ | 2.82$^{a}$ |
| 8 | Difenaconazole (0.05%) 2 sprays (Df-2S) | 4.15$^{ab}$ | 2.74$^{c}$ | 4.08$^{abc}$ | 2.72$^{ab}$ | 4.11$^{bc}$ | 2.62$^{c}$ |
| 9 | Difenaconazole (0.05%) 1 spray (Df-1S) | 3.85$^{cde}$ | 2.36$^{d}$ | 3.75$^{de}$ | 2.33$^{d}$ | 3.80$^{def}$ | 2.34$^{e}$ |
| 10 | Sulphur dust (25 kg/ha) 3 applications (SD-3S) | 4.03$^{bc}$ | 2.78$^{ab}$ | 3.90$^{bcd}$ | 2.76$^{ab}$ | 3.96$^{cd}$ | 2.77$^{ab}$ |
| 11 | Sulphur dust (25 kg/ha) 2 applications (SD-2S) | 3.80$^{de}$ | 2.56$^{c}$ | 3.70$^{de}$ | 2.55$^{c}$ | 3.75$^{efg}$ | 2.57$^{cd}$ |
| 12 | Sulphur dust (25 kg/ha) 1 application (SD-1S) | 3.38$^{f}$ | 2.28d$^{e}$ | 3.30$^{g}$ | 2.27$^{d}$ | 3.34$^{h}$ | 2.27$^{f}$ |
| 13 | Mancozeb (0.25%) 4 sprays (M) | 3.75$^{e}$ | 2.33d$^{e}$ | 3.65$^{de}$ | 2.31$^{d}$ | 3.70$^{fg}$ | 2.32$^{ef}$ |
| 14 | Control (Water spray) (WS) | 3.25$^{fg}$ | 2.21$^{e}$ | 3.33$^{fg}$ | 2.17$^{e}$ | 3.29$^{h}$ | 2.19$^{g}$ |
| 15 | Control (No spray) (NS) | 3.18$^{g}$ | 2.23$^{de}$ | 3.38$^{fg}$ | 2.16$^{e}$ | 3.28$^{h}$ | 2.20$^{g}$ |

Treatment means with the letters in common are not significant by Duncan's New Multiple Range Test at 5 per cent level of significance

**Table 4.** Effect of different spray schedules of fungicides on cost : benifit ratio of cumin

| Sr. No. | Treatments | Average Yield (kg ha$^{-1}$) | Additional* income over control (Rs ha-$^{1}$) | Additional** expenditure over control (Rs ha$^{-1}$) | Net Return (Rs ha$^{-1}$) | ICBR | Net ICBR |
|---|---|---|---|---|---|---|---|
| 1 | WS-3S | 536.5 | 18720 | 2040 | 16680 | 1 : 8.18 | 1 : 7.18 |
| 2 | WS-2S | 522.8 | 17487 | 1360 | 16127 | 1 : 11.86 | 1 : 10.86 |
| 3 | WS-1S | 386.3 | 5202 | 680 | 4522 | 1 : 6.65 | 1 : 5.65 |
| 4 | Hx-3S | 517.4 | 17001 | 2490 | 14511 | 1 : 5.83 | 1 : 4.83 |
| 5 | Hx-2S | 487.8 | 14337 | 1660 | 12677 | 1 : 7.64 | 1 : 6.64 |
| 6 | Hx-1S | 384.7 | 5058 | 830 | 4228 | 1 : 5.09 | 1 : 4.09 |
| 7 | Df-3S | 558 | 20655 | 9480 | 11175 | 1 : 1.18 | 1 : 0.18 |
| 8 | Df-2S | 526.9 | 17856 | 6960 | 10896 | 1 : 1.57 | 1 : 0.57 |
| 9 | Df-1S | 428.1 | 8964 | 3480 | 5484 | 1 : 1.58 | 1 : 0.58 |
| 10 | SD-3S | 442.4 | 10251 | 1380 | 8871 | 1 : 6.43 | 1 : 5.43 |
| 11 | SD-2S | 410.9 | 7416 | 920 | 6496 | 1 : 7.06 | 1 : 6.06 |
| 12 | SD-1S | 340.3 | 1062 | 460 | 602 | 1 : 1.31 | 1 : 0.31 |
| 13 | M | 338.2 | 873 | 3280 | -2407 | - | - |
| 14 | Control(WS) | 332 | - | - | - | - | - |
| 15 | Control(NS) | 328.5 | - | - | - | - | - |

**Market price of difenaconazole @ Rs. 3000/lit, wettable sulphur @ Rs.160/kg, hexaconazole @ Rs.350/lit, sulphur dust @ Rs. 12/kg and mancozeb @ Rs.300/kg

*Cumin price @ Rs. 90/kg and labour cost @ Rs. 150/ day

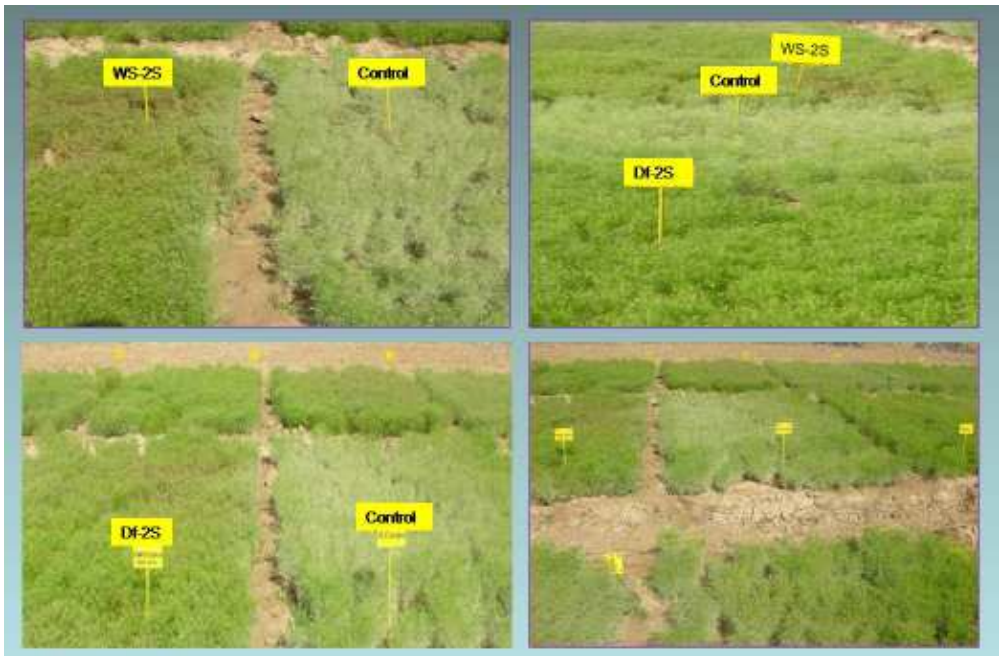


**Plate 1 .** Effect of difenaconazole (Df-2S) and wettable sulphur (WS-2S) on PM

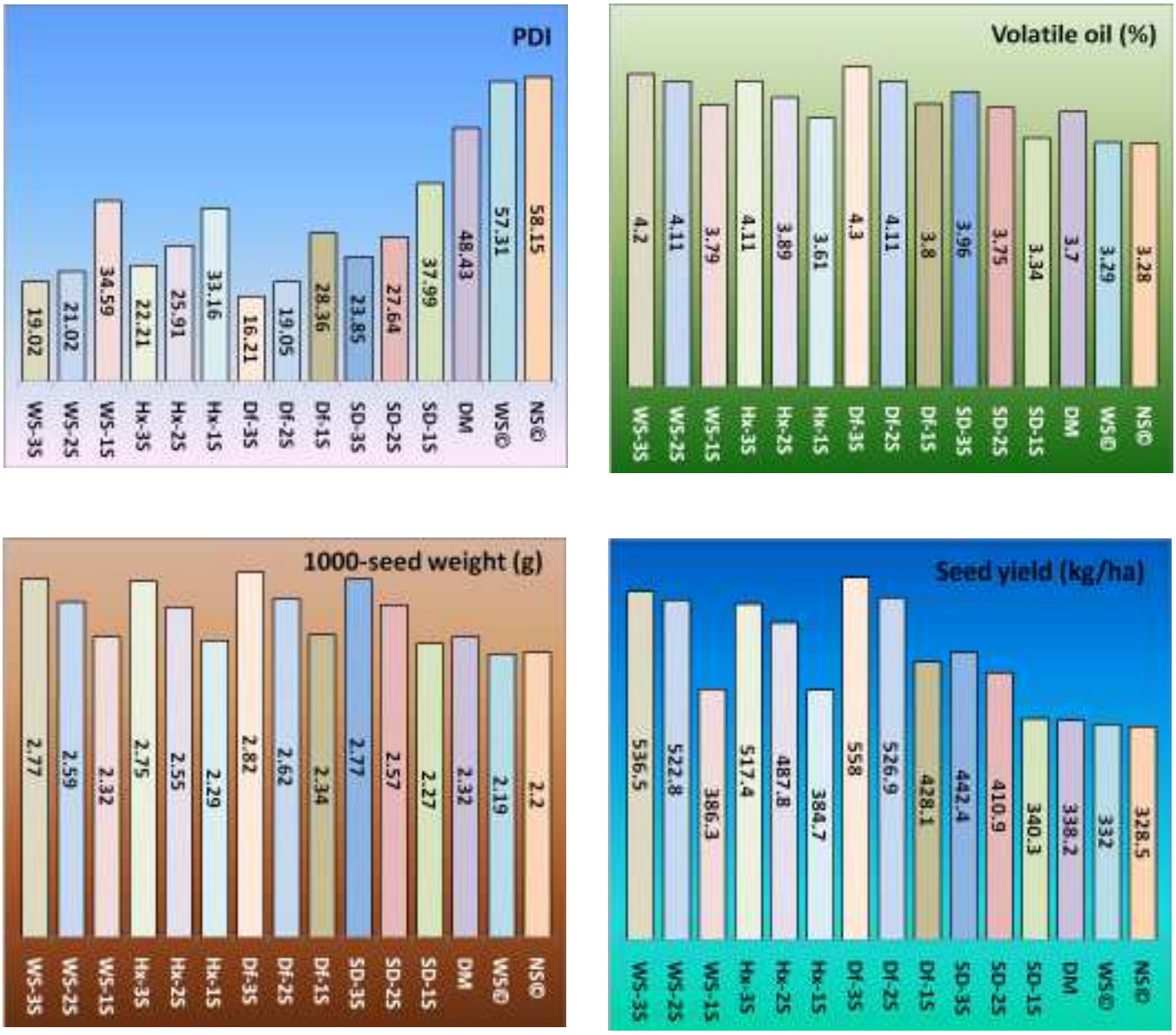


**Fig. 1.** Effect of different spray schedules of fungicides on PDI, seed yield, volatile oil and 1000-seed weigh

oil yield and 1000-seed weight. Thus, two sprays of difenaconazole @ 0.05 per cent proved most effective in reducing disease and recorded 19.05 per cent disease intensity with higher reduction in disease (67.24 %) over control and also gave higher yield (526.9 kg/ha) with 37.7 per cent increase over control and also gave higher volatile oil (4.11 %) and 1000-seed weight (2.62 g) (Table 4.6.4 to 4.6.6). Two sprays of wettable sulphur @ 0.2 per cent was observed next best to difenaconazole (two sprays) in disease intensity (21.02 %) and 63.85 per cent disease reduction with 522.8 kg/ha seed yield (37.2 % increase over control) and also gave higher volatile oil (4.11 %) and 1000-seed weight (2.59 g) followed by hexaconazole @ 0.05 per cent, sulphur dust @ 25 kg/ha and mancozeb @ 0.25 per cent. The year and treatments interaction effect was non significant.

***Economics***

Comparison of economics in managing the powdery mildew through new agro-chemicals is presented in table 4. Results revealed that maximum net Incurred Crop Benefit Ratio (1 : 10.86) was gained with the two sprays of wettable sulphur followed by three sprays of wettable sulphur (1:7.18) in managing the powdery mildew on cumin through agro-chemicals. The two and three sprays of difenaconazole recorded lower disease intensity with higher yield but, lower net ICBR due to higher price of fungicide. The lowest net ICBR (1 : 0.31) was gained with the single application of sulphur 300 mesh dust.

Gohil *et al*. (4) reported significant reduction of powdery mildew disease (*Erysiphe polygoni*) intensity in cumin (*Cuminum cyminum*) by sulphur dusting as compared to control. Mehta *et al*. (7) found that the minimum powdery mildew incidence on *Cuminum cyminum* with highest yields were obtained in plots sprayed with 0.04 per cent Calixin 80 EC. Our findings are very closer to Desai (3) who concluded that under field conditions, spraying of dinocap (0.1 %) and wettable sulphur (0.2 %) were effective in decreasing powdery mildew severity of coriander and thereby increasing volatile oil content by 7.99 and 6.85 per cent, respectively over control. Patel *et al.* (8) proved the superiority of two sprays of difenaconazole 25 EC @ 0.05 per cent over other chemicals in controlling powdery mildew of cumin. Although, it was at par with the spraying of wettable sulphur 80 WP @ 0.2 per cent. Kansara *et al.* (5) noted minimum fenugreek powdery mildew intensity (33.61 %) with highest yield (1134 kg/ha) with two sprays of dinocap followed by wettable sulphur.

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