

APPLE (*Malus x domestica* 'Rome Beauty', 'G. Delicious')
 Cortland', 'Stayman', R. Delicious')
 Fruit rots, *Botryosphaeria* sp.
 Flyspeck; *Zygophiala jamaicensis*
 Sooty blotch; disease complex

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Evaluation of Alternative Fungicide Programs for Control of Fly Speck, Sooty Blotch and Fruit Rots on Apple, 2004.

The trial was conducted in a mature five-cultivar ('Rome Beauty', 'Golden Delicious', 'Stayman', 'Cortland', and 'Red Delicious') research orchard at the Pennsylvania State University, Fruit Research & Extension Center, Biglerville, PA. Trees were arranged in a randomized complete block design with 4 replications. Sprays were applied dilute with an airblast sprayer at 400 psi, which delivered 200 gal/A. Treatment applications were made on 7-14 day intervals from 8 Apr (1/2 green) to 23 Aug. Environmental conditions were highly favorable for diseases due to numerous wetting periods throughout the growing season. Fly speck and sooty blotch symptoms on trees were first observed on 19 and 29 Jul, respectively. Disease incidence was evaluated on Golden Delicious fruits on 6 Aug and 8 Sep. Whole fruit russet was assessed using the severity rating using the Barratt-Horsfall scale of 0-11 then converted to percentage surface area russeted using Elanco conversion tables. Data obtained was analyzed by analysis of variance using appropriate transformations and significance between means was determined by the Fisher's Protected LSD ($P \leq 0.05$).

Incidence of fly speck, sooty blotch and fruit rots was 19, 32 and 17% on 6 Aug and increased to 62, 69 and 26%, respectively, by 8 Sep (about harvest time). All treatment programs controlled fly speck and sooty blotch significantly better than the water sprayed control. Although not statistically different, the Lime sulfur programs (1 and 2.5% levels with and without Vigor-Cal) were more effective in controlling fly speck (harvest count) compared to the standard fungicide program. Significant differences between treatments in terms of russet reaction were observed among the treatments. The Champ (copper), 2.5% lime sulfur and water treated trees resulted in 12.6, 3.03 and 2.9% fruit russet severity, respectively. The standard fungicide program and 1% lime sulfur with and without Vigor-Cal had less than 1 % fruit russet.

| Treatment and Rate/A | Application Timings ^z | % Disease Incidence (6 Aug) ^y | | | % Disease Incidence (8 Sep) ^y | | | % Severity ^x |
|---|----------------------------------|--|----------|------------|--|----------|------------|-------------------------|
| | | Sooty blotch | Flyspeck | Fruit rots | Sooty blotch | Flyspeck | Fruit rots | Fruit Finish/ russet |
| <i>Microsphaeropsis ochracea</i> (P130A) | 1 - 5 | | | | | | | |
| Lime Sulfur 2.5 % (v/v)..... | 6 - 12, 14 - 16, 18, 19 | 1.00a ^w | 0.00 a | 9.50 ab | 6.0 aw | 1.0 a | 17.0 a | 3.03 b |
| Champ Dry Pill 10.0 lb + Trilogy 1.5% (v/v) | 1 | | | | | | | |
| Champ Dry Pill 0.6 lb | 2 - 4, 6 | | | | | | | |
| Champ Dry Pill 1.0 lb..... | 8, 10, 11, 13, 15, 17, 20 | 20.00 b | 17.00 b | 18.50 b | 33.0 b | 40.50 b | 35.5 c | 12.66 c |
| Dithane DF 75WDG 5.0 lb | 1 - 3 | | | | | | | |
| Lime Sulfur 0.5 % (v/v) | 4 - 5 | | | | | | | |
| Lime Sulfur 1% (v/v)..... | 6 - 12, 14 - 16, 18, 19 | 4.00 a | 0.50 a | 11.00 ab | 15.0 a | 4.50 a | 13.5 a | 0.99 a |
| Std Fungicide (+) CK | | | | | | | | |
| Nova 40W 3.0 oz + Dithane DF 75WDG 5.0 lb | 1 - 3 | | | | | | | |
| Ziram 76 DF 3.0 lb + Nova 40W 3.0 oz | 4 | | | | | | | |
| Ziram 76 DF 3.0 lb + Ziram 76 DF 3.0 lb + | 6, 8 | | | | | | | |
| Topsin-M 70W 8.0 oz..... | 10, 11, 13, 15, 17, 20 | 5.00 a | 1.00 a | 6.00 a | 3.5 a | 13.5 a | 16.0 ab | 0.74 a |
| Water Check (-) CK..... | 1 - 20 | 31.50 c | 18.50 b | 16.50 ab | 69.0 c | 62.0 c | 26.0 bc | 2.94 b |
| Dithane DF 75WDG 5.0 lb | 1 - 3 | | | | | | | |
| Vigor Cal 1.0 gal gal + Agro-K Cal-Mag Blend 1.0 qt | 4 - 7 | | | | | | | |
| Vigor Cal 1.0 gal + Agro-K Cal-Mag Blend 1.0 qt + | | | | | | | | |
| Lime Sulfur 1% (v/v)..... | 8 - 12, 14 - 16, 18, 19 | 0.50 a | 1.00 a | 10.00 ab | 2.0 a | 1.5 a | 11.0 a | 0.76 a |

^z Timings: 1 = (1/2" green) 8 Apr; 2 = (Pink) 20 Apr; 3 = (Bloom) 29 Apr; 4 = (Petal fall) 7 May; 5 = 13 May; 6 = 20 May; 7 = 27 May; 8 = 4 Jun; 9 = 14 Jun; 10 = 17 Jun; 11 = 28 Jun; 12 = 8 Jul; 13 = 13 Jul; 14 = 19 Jul; 15 = 26 Jul; 16 = 3 Aug; 17 = 9 Aug; 18 = 12 Aug; 19 = 20 Aug; 20 = 23 Aug.

^y Incidence/50 fruit/replicate.

^x Estimated percent fruit russet using the Barratt-Horsfall rating scale.

^w Means marked with the same letter(s) are not significantly different, Fisher's Protected LSD, $P \leq 0.05$.