

AZOXYSTROBIN FOR ANGULAR AND ALTERNARIA LEAF SPOT CONTROL IN COMMON BEANS: NUMBER OF APPLICATIONS AND FUNGIGATION

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Introduction – Angular leaf spot of beans, caused by *Phaeoisariopsis griseola*, is a serious disease during fall-winter period in Minas Gerais, Brazil. Alternaria leaf spot, caused by various species of *Alternaria* is also a common disease during that period, although yield losses seem not to be as significant as those caused by angular leaf spot. Until recently, Cerconil, a mixture of thiophanate methyl (200 g/kg) and chlorothalonil (500 g/kg), was the most commonly used fungicide for bean disease control. It also has been applied through irrigation water (fungigation) with good results (Vieira and Sumner, 1999). Number of applications of this fungicide varies from two to five at intervals of 7 to 14 days. A new fungicide, azoxystrobin, has been released but there is no information on its effectiveness when applied through irrigation water. Few tests have been done to assess its effectiveness for angular and alternaria leaf spot control. The objectives of this research were to test the number of applications of azoxystrobin necessary for diseases control of common beans and its effectiveness when applied through irrigation water.

Material and Methods – A trial was installed in Viçosa, Minas Gerais State, Brazil, on 29 April (fall) 1999. The bean cultivar Pérola (type III) was sown spaced 0.5 m apart with 15 seeds per meter in plots of four 5 m-long rows. Azoxystrobin (60 g/ha) was applied by a backpack sprayer (400 L/ha) at different days after emergence (DAE): a) 20; b) 20 and 34; c) 20, 34, and 48; d) 20, 34, 48, and 62; e) 20, 34, 48, 62, and 76. Azoxystrobin was also applied at 20, 34, 48, 62, and 76 DAE by a watering-can over the plants simulating sprinkler irrigation of 3.5 mm (35,000 L/ha). Cerconil (2 kg/ha) was applied at 20, 34, 48, 62, and 76 DAE with a backpack sprayer (400 L/ha). An untreated control was also included. A randomized complete block design with 4 replications was used. The trial was sprinkler irrigated weekly. Severity of both diseases were rated two times during the growing season using a 1-9 scale, in which 1 indicates no diseases and 9 dead plants. One square meter of each plot was harvested separately at 111 DAE, and number of pods with symptoms of angular leaf spot was counted.

Results and Discussion – Angular and alternaria leaf spots developed late (83 DAE) in the growing season and their severity at 93 DAE was moderate on untreated control (Table 1). Reduction on the severity of angular leaf spot was achieved with two azoxystrobin applications, and the number of diseased pods was reduced by 61.4% with only one application of azoxystrobin. Cerconil and fungigation with azoxystrobin were able to keep disease at a low level. Azoxystrobin applied 5 times by backpack sprayer provided better control of angular leaf spot on foliage than fungigation. Alternaria leaf spot was reduced with two fungicide applications at 83 DAE, similarly to the treatments of fungigation and Cerconil. At 93 DAE, azoxystrobin applied five times by conventional method provided the best control, but it did not differ from five treatments, included fungigation. Treatments had no significant influence on yield (Table 1). Fungigation with azoxystrobin is encouraged based on this study. Two azoxystrobin applications were sufficient for angular and alternaria leaf spots control.

Table 1. Severity of diseases and yield of common beans in the 1999 trial at Viçosa, Minas Gerais State, Brazil

| Treatments | Angular leaf spot | | | Alternaria leaf spot | | Yield (kg/ha) |
|---|---------------------|---------------------|---|----------------------|---------------------|---------------|
| | 83 DAE ¹ | 93 DAE ¹ | Diseased pods (1m ²) ¹ | 83 DAE ¹ | 93 DAE ¹ | |
| Untreated control | 3.1 a | 5.1 a | 22.8 a | 2.9 a | 3.2 a | 2,918 |
| Azoxystrobin 20 DAE (400 L/ha) | 2.5 b | 4.5 a | 8.8 b | 2.4 ab | 3.2 a | 2,891 |
| Azoxystrobin 20, 34 DAE (400 L/ha) | 1.6 c | 2.9 b | 2.2 c | 1.9 bc | 3.1 ab | 2,825 |
| Azoxystrobin 20,34, 48 DAE (400 L/ha) | 1.0 d | 2.1 c | 0.1 c | 1.4 c | 2.4 ab | 3,077 |
| Azoxystrobin 20, 34, 48, 62 DAE (400 L/ha) | 1.0 d | 1.6 cd | 0.2 c | 1.7 bc | 2.4 ab | 2,850 |
| Azoxystrobin 20, 34, 48, 62, 76 DAE (400 L/ha) | 1.0 d | 1.2 d | 0.0 c | 1.7 bc | 2.1 b | 3,007 |
| Azoxystrobin 20, 34, 48, 62, 76 DAE (35,000 L/ha) | 1.6 c | 2.2 bc | 1.4 c | 1.9 bc | 2.7 ab | 2,992 |
| Cerconil 20, 34, 48, 62, 76 DAE (400 L/ha) | 1.1 cd | 2.0 c | 0.5 c | 1.6 bc | 2.5 ab | 3,007 |
| Mean | 1.62 | 2.72 | 4.51 | 1.94 | 2.72 | 2,946 |

¹ Mean separation by Tukey's test at 5% level. DAE = days after emergence.

Reference

Vieira, R.F. and Sumner, D.R. 1999. Application of fungicides to foliage through overhead sprinkler irrigation – a review. *Pestic Sci* 55:412-422.