

Foliar Fungicides on Soybeans

Purpose:

Asian soybean rust was reported for the first time in North America in the fall of 2004. In 2005 the disease spread as far north as Caldwell county, Kentucky and as far east as Hyde county, North Carolina. Soybean rust has the potential to be a significant soybean disease in Ontario, as it is in South America. An Emergency Use soybean registration has been granted for four foliar fungicides: Quadris, Headline, Tilt and Folicur. Headline fungicide has also been granted a registration for the control of frog eye leaf spot in soybeans.

Some trials in the US have shown a significant yield boost from the application of a foliar fungicide, even in the absence of rust. This yield boost may be a function of controlling low level infestations of bean diseases that have previously been ignored, or they may result from soybean plant responses that are not yet fully understood. In 2005, a number of trials were conducted in various parts of Ontario including Perth County to assess the possible yield benefits of foliar fungicides to control leaf diseases on soybeans.

Methods:

On-farm strip trials were established and data collected from nine sites in Perth County. Yield data was also collected from four similar trials in other parts of southwestern Ontario. All sites were weighed off with a weigh wagon.

With the exception of fungicide applications, fields were treated as a whole when applying herbicides, fertilizers, insecticides, and tillage practices. Whenever possible, crop inputs were applied perpendicular to the direction of the fungicide treatments to reduce non treatment variability being introduced. This ensured that mistakes or misses in field operations occurred across all trial treatments.

The fungicide treatments in Perth county were applied to the trials at the R2 growth stage of the soybean plant (full bloom).

The insecticide component of insecticide/fungicide tank mixes for soybeans could not be assessed in these trials because aphid populations arrived too late. It's believed that soybean foliar fungicides must be applied during the early reproductive stages of the plant (R1-R2), but aphid infestations did not become evident until later in the growing season.

In Eastern Ontario the strip trials were sprayed at the R4 stage. In Eastern Ontario all but the Fourneyview site had Matador insecticide sprayed in the check and fungicide treated blocks.

Leaf samples were taken from the nine Perth county sites and sent to the University of Guelph Pest Diagnostic Clinic for virus and disease detection and identification.

Results:

Table 1. 2005 Soybean Fungicide Yield (bu/ac) Results - Perth Soil and Crop and Eastern Ontario						
Location	Treatment	Stage	Unsprayed	Sprayed	ADVANTAGE	Variety
Steve Coulthard	Quadris	R2	53.4	56.7	3.3	91B33
John Peterson	Headline	R2	65.1	64.3	-0.8	91M60
Jim Hodgson	Headline	R2	59.7	64.3	4.6	Bayfield
Leo Van Geffen	Headline	R2	50.0	51.5	1.5	NA
Rob Van Nes	Quadris	R2	51.0	55.0	4.0	O880
Max Bilyea	Headline	R2	60.9	65.5	4.6	PS 59
Brian Jacobs	Quadris	R2	56.0	59.0	3.0	S10T1
Brian Vink	Quadris	R2	48.0	53.0	5.0	SO3W4
Steve Van Hooster	Quadris	R2	54.0	62.0	8.0	SO3W4
Charlie Dunsmore	Quadris	R2	46.3	54.5	8.2	SO3W4
Charlie Dunsmore	Quilt	R2	46.3	54.5	8.2	SO3W4
Mike Player	Quilt	R2	60.0	65.0	5.0	SO3W4
Bill Dill	Quadris	R2	55.0	58.0	3.0	SO4Z9
Schneckenburger	Folicur	R4	51.9*	53.4	1.5	Pioneer 91B33
Schneckenburger	Folicur	R4	53.7*	55.5	1.8	Pioneer 91B33
Hiltone Farms	Folicur	R4	46.3*	45.0	-1.3	NK S03-W4
Cornerview Farms	Folicur	R4	59.9*	60.7	0.8	NK S03-W4
Bruglane Farms	Folicur	R4	50.0*	51.9	1.9	NK S03-W4
Fourneyview	Headline	R4	42.7	48.2	5.5	Champion
		Average (bu/ac)	53.2	56.7	3.6	
		Average (t/ha)	3.58	3.81	0.24	

* Eastern Ontario sites (check and fungicide treated strips were sprayed with Matador insecticide)

Summary:

An average yield gain of 3.6 bu/ac was realized across these thirteen strip trials in 2005. Large yield increases were not consistent. The cost for strobilurins fungicides (Headline and Quadris) is approximately \$16.50 per acre, excluding application costs. Assuming an application cost of about \$8.50 per acre and a tramping loss of about 1 bu/ac, a 4.6 bu/ac yield increase would be required to break even for a foliar fungicide application (\$16.50 product + \$8.50 application + \$7.00 tramping loss) assuming a value of \$7.00/bu price on soybeans. Late season spraying soybean tramping losses have been reported from as low as 1% to as high as 4% depending on the width of the boom, etc. Of the nineteen trials reported in this study, six showed an economic return to spraying.

These results are similar to 65 foliar fungicide strip trials conducted in Minnesota in 2005, which showed a positive economic return to spraying on about 1/3 of the trials.

<http://www.extension.umn.edu/cropenews/2005/05MNCN59.htm>

The 2005 growing season was relatively hot and dry. Following rainfall, the soybean foliage had adequate time to dry before the next rainfall. Soybean diseases were minimal in these trials and overall yields were excellent (> 50bu/ac). Of the nine Perth County sites, only two

Crop Advances: OMAFRA Field Crop Project Reports

had any diseases detected. At the Steve Van Hooster trial Downy Mildew was confirmed, and at Brian Jacobs' site Anthracnose and Northern Stem Canker were found. The severity of these diseases was minimal at both sites.

Considerable work is underway across North America to understand when and where positive economic returns can be found with the use of foliar fungicides on soybeans. To date economic yield results have been inconsistent when applying foliar fungicides.

Next Steps:

Similar studies should be conducted including fungicide/insecticide tank mixes to assess the economic value of using these products on soybeans.

Acknowledgements:

Special thanks to all those who participated in the project, particularly the SCIA members that conducted the trials.

Project Contacts:

Stay tuned for future results and contact Charlie Dunsmore, President of Perth SCIA or Horst Bohner, horst.bohner@omaf.gov.on.ca for further information.