Evaluation of Shepherd® Fungicide Trunk Injection for Controlling Diplodia Blight of Austrian Pine: 2009-2011

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Twenty-two Austrian pines (*Pinus nigra*) along one street and in one park in Lincoln, Nebraska, were selected for the evaluation. Trees ranged in trunk diameter from 14 to 24 inches (36 to 61 cm). Trees were paired based on proximity to each other, size, and current degree of damage from Diplodia blight (*Diplodia pinea*). Eleven trees, one in each pair, were treated with Shepherd® Fungicide (propiconazole) using ArborSystems's Portle® Tip injector in October or November of 2009 or April of 2010. Treatments were applied at the rate of 1 injection (4 ml)/4 inches (10 cm) of trunk circumference near the base of the tree (within 12 inches (30 cm) of the ground). High resolution images were taken of the crowns of the trees in September 2009 before treatment and in July 2011 after approximately one and one-half growing seasons. Images of each tree from 2009 and 2011 were compared to determine the degree of crown improvement or increased damage. Changes in crown condition were recorded as high, moderate and low degree of improvement (indicated as 3, 2 and 1, respectively), no change (0), and low, moderate and high degree of increased damage from the disease (-1, -2 and -3, respectively). Changes in crown condition between pairs of trees were analyzed by the Wilcoxon Matched-Pairs Signed-Ranks Test.

Trees treated with Shepherd® Fungicide injections showed greater crown improvement compared to the untreated trees (significant at p = 0.0625). No evidence of injury from the treatment was observed in the crown or at the injection sites.

Treatment and rate	Change in crown condition*	
Shepherd® Fungicide, 1 injection (4 ml)/4 in. (10 cm) of trunk circums	ference 2.4**	
Control (untreated)	1.8	

^{*} On a scale of 3 to -3 (high degree of improvement to high degree of increased damage)
**Significantly different from the control at p = 0.0625 (Wilcoxon Matched-Pairs Signed-Ranks Test)

11/4/2011

Amt of Product

Found

Injected Time to inject

Rate = 4ml every

4" of

circum ference

Diplodia trial - Lincoln, 2009

Treatments: A = Propaconazole (Shepherd)

Tebuconazole C = Untreated control

Be sure to treat priority 1 trees.

Treat trees with priority 2-5 as product is available.

Rows are colored based on priority. Tmt A is a darker shade.

Cocation Tree no. Rep. Treatment Treatment Common Co					Prio	rity	
237 51	Location	Tree no. Rep.	Treatment				
240 S1	Sunken Gardens	236 S1	В	1			
Normal Blvd. beginning S end near South St. along W edge of trees 269 N3		237 S1	Α	1			
beginning S end near South St. along W edge of trees 269 N3		240 S1	С	1			
near South St. 232 N1 C 1 along W edge of trees 439 N2 B 1 trees 269 N3 A 4 427 N2 A 1 447 N2 C 1 256 N3 B 4 443 N4 B 2 X 314 N3 C 4 X 11 N5 A 5 X 5 X 316 N5 B 5 X 5 X 236 N5 C 3 X 297 N6 C 3 X 301 N6 B 3 X 277 N4 C 2 X N of Sumner 226 N7 C 1 X 269 N7 B 1 X 269 N7 B 1 X beginning N end 288 N8 B 4 X 254 N7 A 1 X beginning E edge of 324 N9 C 1 X 254 N8 C 4 X <	Normal Blvd.	238 N1	Α	1			
along W edge of trees 269 N3	beginning S end	257 N1	В	1			
trees	near South St.	232 N1	С	1			
427 N2	along W edge of	439 N2	В	1			
447 N2 C 1 256 N3 B 4 443 N4 B 2 X 314 N3 C 4 X 11 N5 A 5 X 316 N5 B 5 X 236 N5 C 5 X 266 N6 A 3 X 297 N6 C 3 X 277 N4 C 2 X 248 N4 A 2 X N of Sumner 226 N7 C 1 X 269 N7 B 1 X 269 N7 B 1 X beginning N end 288 N8 B 4 X 254 N7 A 1 X beginning E edge of 324 N9 C 1 X trees going S 283 N10 A 3 X 278 N8 A 4 X 246 N9 A 1 X 246 N9 A 1 X	trees	269 N3	Α			4	
256 N3		427 N2	Α	1			
443 N4 B 2 X 314 N3 C 4 X 11 N5 A 5 X 316 N5 B 5 X 236 N5 C 5 X 266 N6 A 3 X 297 N6 C 3 X 277 N4 C 2 X 248 N4 A 2 X 269 N7 B 1 X 269 N7 B 1 X beginning N end 288 N8 B 4 X 254 N7 A 1 X beginning S edge of 324 N9 C 1 X trees going S 283 N10 A 3 X 278 N8 A 4 X 246 N9 A 1 X 246 N9 A 1 X 241 N11 B 3 X 307 N10 B 3 X		447 N2	С	1			
314 N3 C 4 X 111 N5 A 5 X 316 N5 B 5 X 236 N5 C 5 X 266 N6 A 3 297 N6 C 3 X 301 N6 B 3 X 277 N4 C 2 248 N4 A 2 X 269 N7 C 1 X 269 N7 B 1 X 254 N7 A 1 X beginning N end just S of Sumner along E edge of trees going S 283 N10 A 3 278 N8 A 4 X 246 N9 A 1 319 N10 C 3 X 21 X 314 N3 C 4 X 5 X 5 X 5 X 5 X 5 X 5 X 5 X 6 X 6 X 6 X 6 X 7 X 7 X 7 X 7 X 7 X 8 X 7 X 8 X 7 X 8 X 8 X 8 X 8 X 8 X 8 X 8 X 8 X 8 X 8		256 N3	В			4	
11 N5 A 5 X 316 N5 B 5 X 236 N5 C 5 X 266 N6 A 3 297 N6 C 3 X 301 N6 B 3 X 277 N4 C 2 248 N4 A 2 X 269 N7 B 1 X 269 N7 B 1 X 254 N7 A 1 X beginning N end just S of Sumner along E edge of trees going S 283 N10 A 3 278 N8 A 4 X 246 N9 A 1 319 N10 C 3 X 316 N5 B 5 X 3 X 30		443 N4	В		2		Χ
316 N5 B 5 X 236 N5 C 5 X 266 N6 A 3 297 N6 C 3 X 301 N6 B 3 X 277 N4 C 2 248 N4 A 2 X 269 N7 C 1 X 269 N7 B 1 X 254 N7 A 1 X beginning N end just S of Sumner along E edge of trees going S 283 N10 A 3 278 N8 A 4 X 246 N9 A 1 319 N10 C 3 X 236 N5 X 256 X 257 N6 C 3 X 258 X 258 X 258 N8 B C 4 X 258 N8 C 4 X 258 N8 C 4 X 258 N8 C 3 X 278 N8 C 4 X 258 N8 C 3 X 278 N8 C 3 X 28 X X		314 N3	С			4	Χ
236 NS C 5 X 266 N6 A 3 297 N6 C 3 X 301 N6 B 3 X 277 N4 C 2 248 N4 A 2 X 269 N7 C 1 X 269 N7 B 1 X 254 N7 A 1 X beginning N end just S of Sumner along E edge of trees going S 283 N10 A 3 278 N8 A 4 X 246 N9 A 1 319 N10 C 3 X 261 N S X 262 NS X 278 N8 A 4 X 241 N11 B 5 X 307 N10 B 3 X		11 N5	Α				5 X
266 N6		316 N5	В				5 X
297 N6 C 3 X 301 N6 B 3 X 277 N4 C 2 X 248 N4 A 2 X N of Sumner 226 N7 C 1 X 269 N7 B 1 X beginning N end 288 N8 B 4 X just S of Sumner 307 N9 B 1 X along E edge of 324 N9 C 1 X trees going S 283 N10 A 3 X 278 N8 A 4 X 254 N8 C 4 X 246 N9 A 1 319 N10 C 3 X 241 N11 B 5 X 307 N10 B 3 X		236 N5	С				5 X
301 N6 B 3 X 277 N4 C 2 248 N4 A 2 X N of Sumner 226 N7 C 1 X 269 N7 B 1 X 254 N7 A 1 X beginning N end just S of Sumner 307 N9 B 1 X along E edge of 324 N9 C 1 X trees going S 283 N10 A 3 X 278 N8 A 4 4 X 254 N8 C 4 X 246 N9 A 1 319 N10 C 3 X 241 N11 B 5 X 307 N10 B 3 X		266 N6	Α		3		
277 N4		297 N6	С		3		Χ
248 N4		301 N6	В		3		Χ
N of Sumner		277 N4	С		2		
269 N7		248 N4	Α		2		Χ
254 N7	N of Sumner	226 N7	С	1			Χ
beginning N end just S of Sumner along E edge of trees going S		269 N7	В	1			Χ
just S of Sumner along E edge of trees going S		254 N7	Α	1			Χ
along E edge of trees going S	beginning N end	288 N8	В			4	Χ
trees going S	just S of Sumner	307 N9	В	1			Χ
278 N8 A 4 X 254 N8 C 4 X 246 N9 A 1 319 N10 C 3 X 241 N11 B 5 X 307 N10 B 3 X	along E edge of	324 N9	С	1			Χ
254 N8 C 4 X 246 N9 A 1 319 N10 C 3 X 241 N11 B 5 X 307 N10 B 3 X	trees going S	283 N10	Α		3		Χ
246 N9 A 1 319 N10 C 3 X 241 N11 B 5 X 307 N10 B 3 X		278 N8	Α			4	Χ
319 N10 C 3 X 241 N11 B 5 X 307 N10 B 3 X		254 N8	С			4	Χ
241 N11 B 5 X 307 N10 B 3		246 N9	Α	1			
307 N10 B 3 X		319 N10	С		3		Х
		241 N11	В				5 X
					3		
242 N11 A 5 X		242 N11	А				5 X
497 N11 C 5 X		497 N11					5 X

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15	25 for 2	4/1/10	
19		4/1/10	
16	10		Marked on West
19		4/1/10	Marked on West
17	9	4/1/10	
17		11/30/09	
16		11/30/09	
19		11/30/09	
15	9	10/20/09	
14	12	10/20/09	
14	7	10/20/09	
16		11/30/09	
16		11/30/09	
14	10	10/20/09	
			,
13	7	10/20/09	
19	20	10/20/09	
11	12	10/20/09	
18	18	10/20/09	
			,
11	15	10/20/09	
13	10	10/20/09	,
			,
			Could not find
14	8	10/20/09	
			Could not find
14	19	10/20/09	

Date of Injections