

Evaluation of Plant Health Effects and Tolerance of Field Corn to the Fungicide Penthiopyrad (DuPont™ Vertisan™) Applied Postemergence.

Cole A. Stalter*, University of Illinois, Urbana, IL; Larry H. Hageman and Scott E. Swanson, DuPont Crop Protection, Rochelle, IL and Marsha J. Martin, DuPont Crop Protection, Columbus, OH.

INTRODUCTION

Applications of some fungicides to field corn have been shown to provide certain plant growth health effects such as prolonged greening and improved standability (Bartlett, *et al.* 2002). Penthiopyrad (DuPont™ Vertisan™) an SDHI mode of action, Group 7 fungicide has been developed by DuPont Crop Protection for residual, preventative and post-infection control of plant diseases in many crops (DuPont, 2012). Applications of Vertisan™ in Europe have been shown to increase shoot biomass and dry root mass of winter wheat and oilseed rape (Broadley and Rossall, 2015).

OBJECTIVE

A field study was conducted at the DuPont Rochelle Illinois Midwest Field Research Station to evaluate the potential for plant health effects and tolerance of field corn following a postemergence application of Vertisan™ fungicide at the V3-V4 growth stage. Results from this study are summarized in this poster.

METHODS AND MATERIALS

Pioneer Hybrid 'P0533AM1' was planted into a conventional tilled, weed free, loam soil with 4% organic matter, a soil pH of 5.7 and a CEC of 16.9 in a RCB design with four replications. Postemergence applications of fungicide were made at the V3-V4 corn stage. Vertisan™ alone was applied at its recommended rate of 140 grams of ai/ha (9.6 oz. product/a) and at its 2X rate of 280 grams of ai/ha (19.2 oz. product/a) with non-ionic surfactant (NIS) at a rate of 0.25% V/V. Glyphosate (Abundit® Extra herbicide) at 840 grams of ai/ha and AMS at 2242 g ai/ha plus Vertisan™ were also included as tank mix treatments. Visual crop response was rated at 7 and 14 days after application as % injury using a scale of 0%= no injury/crop response/control and 100% = complete kill. Vigor ratings were taken at 0,7,14 and 28 days after treatment (DAT). Ratings were done both visually and using a Greenseeker Handheld Crop Sensor. Root mass dry weights and fresh shoot weights were taken for six plants per plot at 14 and 28 days after application.



Treatment 2- Recommended rate of Vertisan™ tank mixed with Abundit® Extra, taken 0 DAT



Treatment 2- Recommended rate of Vertisan™ tank mixed with Abundit® Extra, taken 28 DAT



Treatment 5- Untreated Check, taken 0 DAT



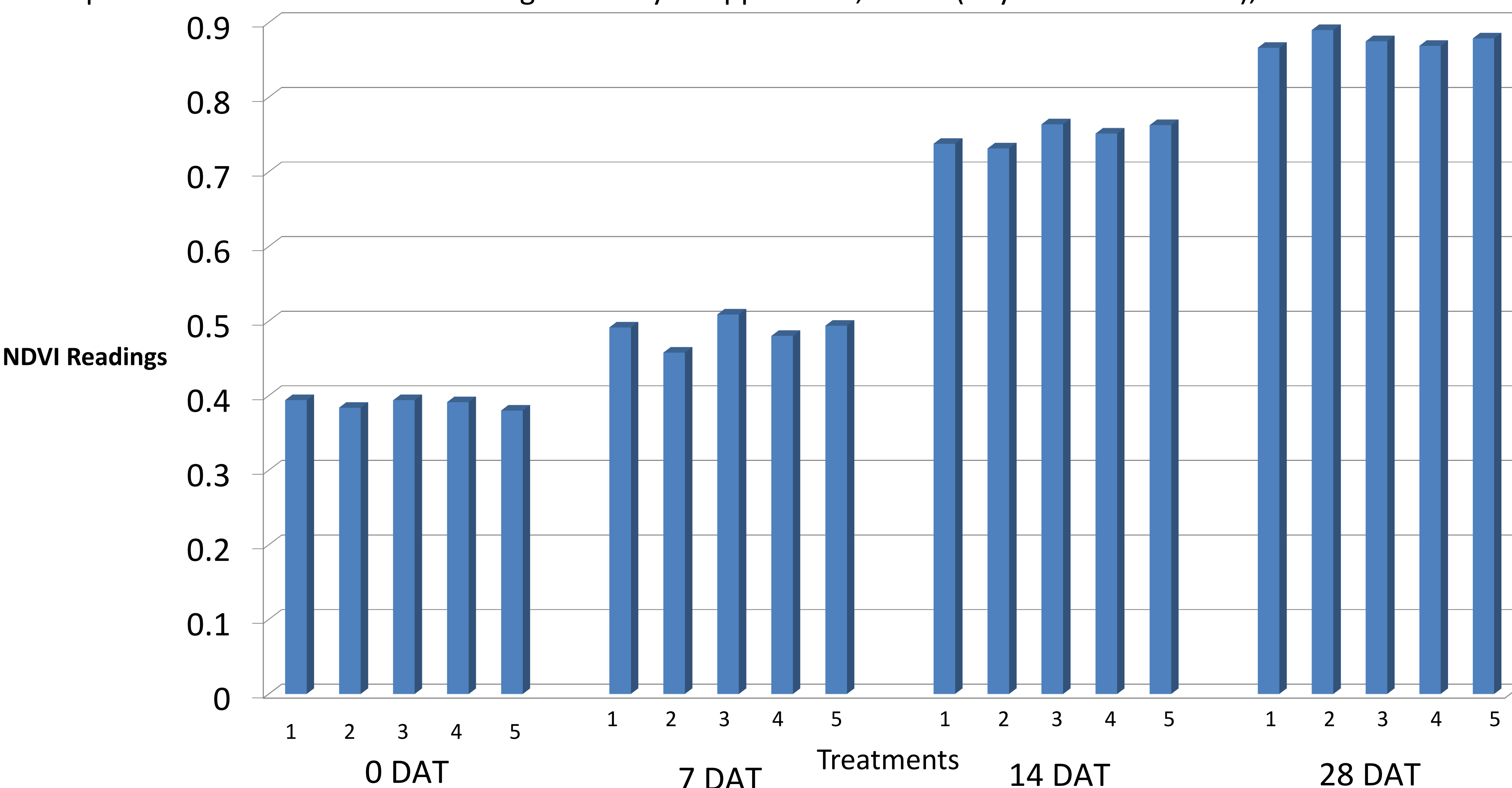
Treatment 5- Untreated Check, taken 28 DAT

Table 1. Fresh Shoot Biomass(grams) , Dry Root Weight(grams) and Visual Crop Injury Evaluations for Various Vertisan™ Treatments at 14 and 28 DAT on Field Corn.

Treatments	Rate (g ai/ha)	14 DAT			28 DAT		
		Fresh Shoot Biomass (grams)	Dry Root Weight (grams)	Crop Injury (%)	Fresh Shoot Biomass (grams)	Dry Root Weight (grams)	Crop Injury (%)
1 Vertisan™ + NIS ¹	140 + 0.25% v/v	91 a ²	1.6 a	0 a	440 a	6.9 a	0 a
2 Vertisan™+ Abundit® Extra +AMS ³	140 + 840 + 2242	95 a	1.8 a	0 a	452 a	7.0 a	0 a
3 Vertisan™+ NIS	280 + 0.25% v/v	101 a	2.0 a	0 a	445 a	7.6 a	0 a
4 Vertisan™+ Abundit® Extra +AMS	280 + 840 + 2242	103 a	1.7 a	0 a	458 a	7.4 a	0 a
5 Untreated Check	-	98 a	1.6 a	0 a	433 a	6.7 a	0 a

¹ - NIS = Non-Ionic Surfactant ² - mean separation achieved using Tukey's LSD at 0.05 level ³ - AMS = Ammonium Sulfate
2015, DuPont Rochelle Illinois Field Station Trial Results

Figure 1. NDVI readings collected utilizing the Greenseeker Handheld Crop Sensor for Crop Vigor evaluations. Figures shown are the averages of the NDVI (Normalized Difference Vegetation Index) readings from the four replications for treatments 1 through 5 at day of application, 7 DAT (days after treatment), 14 DAT and 28 DAT.



RESULTS AND DISCUSSION

In this trial, field corn was found to be tolerant to applications of penthiopyrad (Vertisan™) fungicide as the treated corn showed no crop injury when Vertisan™ was applied alone or tank mixed with glyphosate (Abundit® Extra). The corn fresh shoot biomass and dry root weight data measured at 14 and 28 DAT showed no statistically significant differences in the Vertisan™ treated versus the untreated field corn (Table 1). The Greenseeker Handheld Crop Sensor NDVI readings collected at 0,7,14 and 28 DAT (Figure 1) also provided no significant differences in crop vigor between the treated and untreated field corn.

CONCLUSION

Results from this field trial showed that penthiopyrad (Vertisan™) and penthiopyrad tank mixed with glyphosate (Abundit® Extra) is safe for use on glyphosate-tolerant field corn as a broad spectrum fungicide. Results also show that Vertisan™, applied postemergence, provides no significant increases in crop vigor, shoot biomass and dry root mass of field corn.

LITERATURE CITED

(2012). DuPont™ Vertisan™ fungicide technical bulletin. DuPont Corporation. DuPont Canada.

Bartlett, D.W., Clough, J.M., Godwin, J.R., Hall, A.A., Hamer, M., and Parr-Dobrzanski, B. (2002). Review- The Strobilurin Fungicides. *Pest Manag. Sci.* 58:649-662.

Broadley, M. and Rossall, S. (2015). Personal Communication.



The miracles of science™

Always read and follow all label directions and precautions for use when using any pesticide alone or in tank-mix combinations. Unless indicated ™, SM and ® are trademarks of DuPont or its affiliates. © 2015 DuPont. Greenseeker® (Trimble)

