

Project Title: Plant growth regulator effects on spring wheat height and agronomic performance (4W3163)

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Objectives: To determine the effect of spring wheat growth stage on the activity of Cerone and Palisade plant growth regulators.

Results:

This study was conducted in a field which had been in alfalfa for the past four years and was fertilized with 27-30-120-24 lb/A of N-P-K-S. ‘Scholar’ spring wheat was planted into a conventionally tilled seed bed on April 19. The seed was planted two inches deep, on six inch row spacing’s, at a rate of 75 lb/A.

The factorial experiment consisted of two plant growth regulators (PGR’s) applied at four growth stages. Cerone and Palisade plant growth regulators were applied at 0.109 lb ai/A and 0.250 lb ai/A , respectively, in 20 GPA using a backpack sprayer equipped with Teejet XR11002 nozzles. Applications were made to spring wheat at jointing, flag leaf, booting, and heading stages of development (Table 1). The experimental design was a randomized complete block, with three replications.

Table 1. Application information.

Growth stage	Jointing	Flag leaf	Booting	Heading
Zadoks scale	31	39	45	55
Application date	7-Jun	22-Jun	26-Jun	28-Jun
Air temperature (F)	72	78	57	89
Soil temperature (F)	64	72	60	81
Relative humidity (%)	47	65	90	30

Both compounds reduced wheat height when applied at flag leaf and boot growth stages, with the greatest height reduction being observed with applications made at the flag leaf stage (Table 2). At the same time, there was a delay in heading when either product was applied at flag leaf. In addition, Palisade caused a slight delay in heading when applied at jointing. Yield was not affect by either product, regardless of application timing. Similar results were observed for thousand kernel weights (TKW). There was a trend ($p=0.064$) for increased test weights when Palisade was applied at the last two stages of growth.

Summary:

Overall, both compounds reduced wheat height without adversely impacting grain yield or quality in the absence of lodging pressure.

Funding Summary: Budget information to be provided by OSP. No other grant support for this project.

MWBC FY2011 Grant Submission Plans: Resubmittal is planned.

Table 2. Spring wheat response to plant growth regulators. Kalispell, MT 2010.

Treatment	Timing	Heading (Jualian)	Height (inches)	Yield (bu/A)	TWT (lb/bu)	TKW (g)
check		178.70	36.60	75.30	62.70	39.28
Palisade	Jointing	180.00	36.60	71.10	63.07	39.03
Palisade	Flag leaf	181.00	30.60	70.60	62.97	37.77
Palisade	Booting	179.00	33.10	76.60	63.20	39.29
Palisade	Heading	178.30	34.80	80.70	63.33	40.11
check		179.00	37.40	75.00	62.73	38.86
Cerone	Jointing	179.30	37.90	71.40	62.63	38.82
Cerone	Flag leaf	180.00	33.30	81.20	62.93	39.84
Cerone	Booting	179.30	34.10	79.90	63.00	39.15
Cerone	Heading	178.30	36.00	80.10	62.93	40.34
MIN		178.30	30.60	70.60	62.63	37.77
MAX		181.00	37.90	81.20	63.33	40.34
MEAN		179.29	35.04	76.19	62.95	39.25
LSD (P=.05)		1.18	2.14	9.08	0.43	1.82
CV		0.38	3.56	6.95	0.40	2.70
TRT Prob>F		0.0035	0.0001	0.127	0.0643	0.2429

Palisade was applied at 7 oz/A. Cerone was applied at 8 oz/A.