

DATE: November 9, 1994

A PROGRESS REPORT OF THE 1994 M-P-A WT™ TREATMENT TO DRY LAND SPRING WHEAT.

TITLE: *Effect of M-P-A WT™, a combination of humic acid, bio-growth stimulants & micro nutrient fertilization, on yield, quality, and nutrient utilization of wheat. (Planter Band)*

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SIGNIFICANT ACCOMPLISHMENTS:

Field plot work completed for year 1 of 3. All data except mineral concentration and plant uptake analyzed.

FUNDING HISTORY:

Year Initiated: 1993
Funding for 1993 - 1994, this donor: \$2,500

OBJECTIVE: Evaluate if additions of micro-nutrients and plant growth (M-P-A WT™), coupled with phosphate, using ammonium poly phosphate commonly called "10-34-0", placed at planting time by the method of banding via injection 1.5 inches below the seed piece, increases the yield and/or quality of wheat.

INTRODUCTION

The soils in dryland wheat producing areas of the Pacific Northwest tend to be alkaline. Soil pH is often between pH 8.0 and 9.0. They also contain high levels of calcium and magnesium carbonates. Because of the high calcium levels, it is often difficult to maintain sufficient levels of soluble phosphorus. Wheat growers have found that by injecting liquid phosphorus fertilizers, such as 10-34-0, below the wheat seed at planting that the phosphorus level in the plant stays higher. Even so, much of the phosphorus becomes unavailable to the plant. M-P-A WT™ was designed to be added to liquid phosphorus fertilizers to help extend the availability of phosphorus to the plant.

EXPERIMENTAL DESIGN

DESCRIPTION OF TEST PLOT

- Location: Six miles North - two miles East of Davenport in the county of Lincoln, Washington, State.
- Crop: Spring Wheat Variety: Penawanwa
- Date of Seeding: April 13, 1994
- Seeding Rate: 52 pounds/acre
- Plot size: 144 acres
- Weather Conditions at planting:
 - Air temperature – 57° F
 - Wind direction & Speed - N. 13
- Soil
 - Soil type - sandy loam.
 - Soil Temperature at planting - 53°F
 - Soil Moisture at planting - Normal.
 - The ground selected at HP farms was flat ground.
 - Topography was uniform without rock piles or interruptions in the test plots.
- Average Rain Fall for this topographical region: 18 -22 inches.
- Actual Rainfall for 1993 crop: 16.9 inches. *(below average)
- Tillage: Conventional

PLOT DESIGN

The test field was divided into two plots. One plot (A) of 72 acres was designated for the treatment area. The second plot (B) of 72 acres, was designated for the control or non-treatment area.

DESCRIPTION OF TEST PLOTS

	NORTH	
TOTAL TEST AREA:	TREATED 72 ACRES	PLOT (A)
144/ac	CONTROL 72 ACRES	PLOT (B)
	SOUTH	

The field was divided from East to West for ease of application and harvesting plots for the grower. It was also thought that this design would not introduce significant extraneous variables in the trial.

TREATMENT DESIGN

Plot No:	Treatment	
Plot A	Treated	1. Three Quarts M-P-A WT™ per acre
Plot B	Control	1. No M-P-A WT™.
Plots A & B	Treated & Control	1. 10 pounds of Phosphate using 10-34-0 per acre 2. 7 pounds of Sulfur using 9-0-0-10 per acre 3. 5 pounds of Nitrogen using 20-0-0 Urea per acre

Pesticides were used throughout all plots which included: One half pint of Buctril by Rhone - Poulenc, 3/10 of an ounce of Finesse by Dupont and one quart per 100/g of Spreader 90 by United Agri Products.

APPARATUS

1. **International 10 inch wheat drills**
 - a. Spacing 10 inches
 - b. Speed: 3.5
2. **Harvester**
 - a. John Deer 6622 side hill used on plots A & B.
3. **Injection Pump**
 - a. Type of pump was a Hypro-Centrifical ground drive.
 - b. Flow devider was a Red Ball system.
 - c. Type of hose size was one inch with a 3/4 I.D.
 - d. Placement tubes were spaced 10" at every opening on planter drill.
4. **Pak Tank - The holding vessel for the solutions used for treatment.**
 - a. The type of tank used was a Cal-Poly™.
 - b. 500 gallon capacity.
 - c. The tank was placed on the planter (drills).
 - d. The vessel had constant agitation via a by-pass valve from the pump.

THE MEASURED VARIABLES

5. Root Mass
6. Tillers per plant
7. Visual color of plant
8. Yield
9. Kernel Test Weights

RESULTS

YIELDS:

The data are shown in Figure 1 below.

Plot (A) TREATED	3.2 acres were measured and cut out of the 72 acre plot. The balance of the 72 acre plot was cut.	Yield: 62.37 bu/ac Yield: 61.97 bu/ac
Plot (B) CONTROL	A Single harvest of 72 acres.	Yield: 43.69 bu/ac

The yield difference between the treated and the control was 18.28 bushels of wheat per acre.

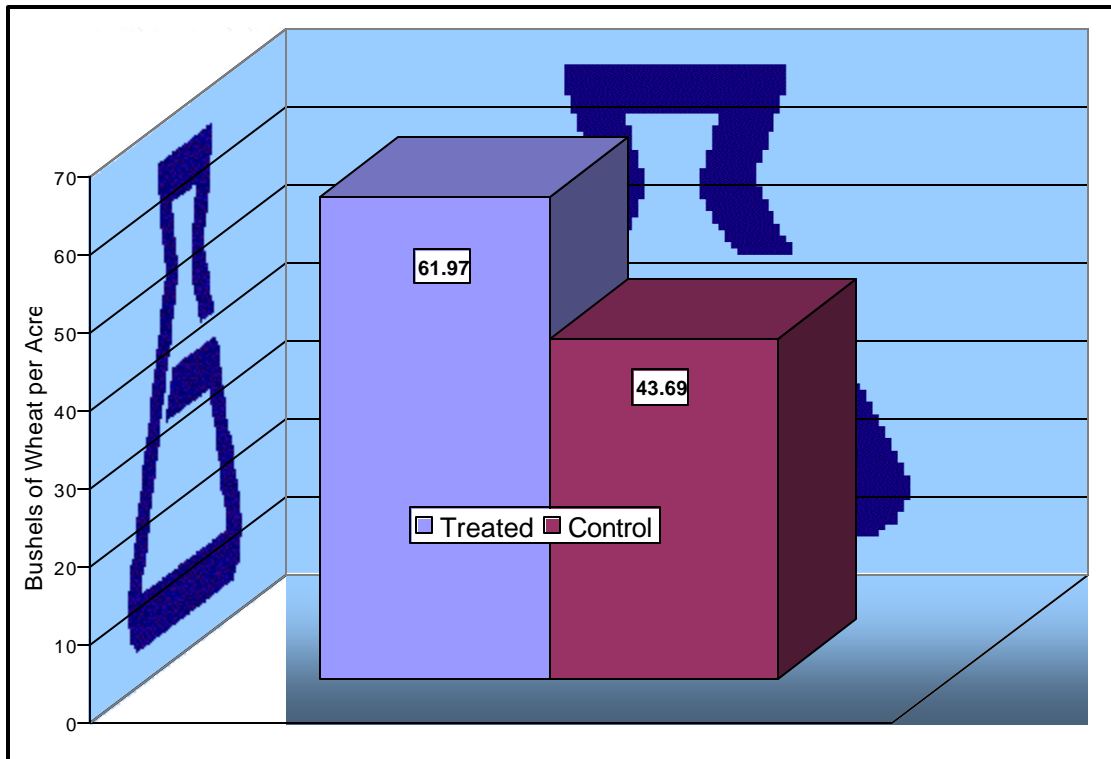


Figure 1. The yields, in bushels of wheat per acre, of the control and treated plots. The values are of a single harvest sample. The treated plants received three quarts of M-P-A WT™ per acre added to the regular planting-time fertility program.

ROOT MASS:

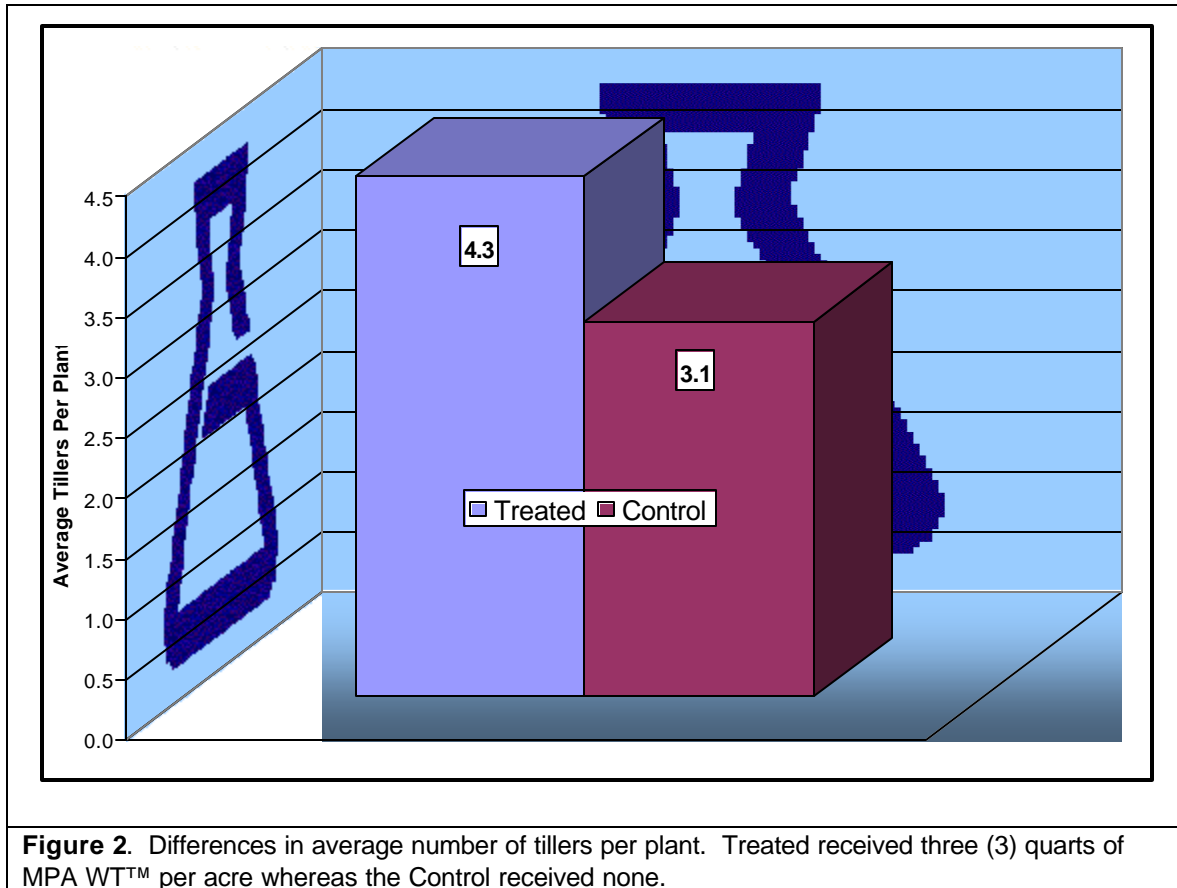
No empirical data was collected for either treatment. However, the root mass was visually examined several times during the season. The roots of treated plants appeared to have both more total root mass and more fine roots than the control plants.

TILLER NUMBER

The number of tillers was counted at stooling on June 2, 1994. Three sites were randomly chosen in each of the control and treatment plots. Twenty (20) plants were chosen at each location.

Treated (Plot A): Average number of tillers = 4.3.¹

Control (Plot B): Average number of tillers = 3.1.



COLOR DIFFERENCES IN FOLIAGE:

The control and treated plots were evaluated visually several times over the season. The treated plants were consistently darker green than the untreated plants.

TEST WEIGHT:

Test weights for both plot's A & B both determined. Both plots were graded as number 1.

¹ The treated grain was observed to germinate faster than the control

DISCUSSION

At mid-season, the average number of tillers in the treated plants were greater than in the control plants. The harvest from the treated plot was greater than from the control plot by 18.28 bushels per acre. Because there was only a single sample in the data, we could not do any statistical analysis of this data. This will be addressed in future trials.