

DATE: November 9, 1994

**A PROGRESS REPORT OF THE 1993 - 1994 M-P-A WT™ TREATMENT
TO DRY LAND WINTER WHEAT. (Planter Band)**

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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**Product
Manufacturer:** Northwest Agri Product, Inc.
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Cooperator: Jim Linstrum
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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: Determine if additions of micro-nutrients and plant growth stimulants (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 2 inches below the seed piece, increase the yield and quality of dryland winter wheat.

EXPERIMENTAL DESIGN

DESCRIPTION OF TEST PLOT

- Location: T 24 N. R 37 E. Sec 32, seven miles south of Davenport, in the county of Lincoln, Washington State.
- Crop: Winter Wheat Variety: Eltan
- Planting Date: September 11, 1993
- Seeding Rate: 56 pounds an acre
- The field was seeded according to conservation tillage - i.e. following terrain.
- Field size: 558 acres
- Weather conditions at time of planting:
 - Air temperature – 80°F.
 - Wind direction & Speed -N/A,
- Soil
 - Temperature at planting was 68° F
 - Soil Moisture at planting was normal.
 - Soil type was sandy loam.
 - The ground selected at Linstrum Farms was rolling terrain.
 - No rock piles or interruptions were found in the research plot.
- Average Rain Fall for this region: 14 - 16 inches.
- Actual Rainfall for 1993 crop: 9.8 inches. *(below average)
- Tillage: Minimum tillage

The test field was divided into two plots. Plot (A), the M-P-A WT™ treated area, contained 279 acres was. Plot (B), the control area, also contained 279 acres.

DESCRIPTION OF TEST AREAS

	WEST	
TOTAL TEST AREA: 558/ac	TREATMENT 279 ACRES	PLOT (A)
	CONTROL 279 ACRES	PLOT (B)
	EAST	

TREATMENT DESIGN

Plot No	Treatment/Control	Treatment Variables
Plot A	TREATED	1. 3 Quarts of M-P-A WT™
Plot B	CONTROL	1. No M-P-A WT™
Plots A & B	Both 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. These were: One half pint of Buctril by Rhone - Poulenc, 3/10 of an ounce of Finesse by Dupont, and 1 quart per 100/g of Spreader 90 by United Agri Products.

Prior to Seeding on 6-03-93, the grower fertilized using a cultiweeder. The rate was 30 lbs. of (N) & 6 lbs. of (S) using aqua ammonia + thiosul.

THE EVALUATED VARIABLES WERE

1. Root Mass
2. Number of Tillers
3. Plant Color
4. Yield
5. Grain Test Weights

APPARATUS

1. **Great Plains 14 inch wheat drills**
 - a. Spacing 14 inches
 - b. Depth: 3 inches
 - c. Speed: 3.4
 - d. Volume/acre: 10 gallons

2. **Harvester**
 - a. International 1480 used on plots A & B.

3. **Injection Pump**
 - a. Type of pump was a Hydraulic-Centrifical.
 - b. Flow divider was N/A, however a pressure guage was present on the system.
 - c. Hose size was one inch with a 3/4 I.D.
 - d. Placement tubes were spaced 14" 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 Raven™
 - b. It had a 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.

RESULTS

YIELDS

The data are shown in Figure 1 below.

Plot (A) M-P-A WT™ Treatment	20 acres were measured and cut out of the 279 acre plot. 3 sub samples were taken.	Mean Avg. Yield: 75.62 bu/ac
Plot (B) CONTROL	20 acres were measured and cut of this 279 acres plot. 3 sub samples were taken.	Mean Avg. Yield: 48.40 bu/ac

The average yield increase between the treated versus the control was 27.22 bushels of wheat per acre.

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.

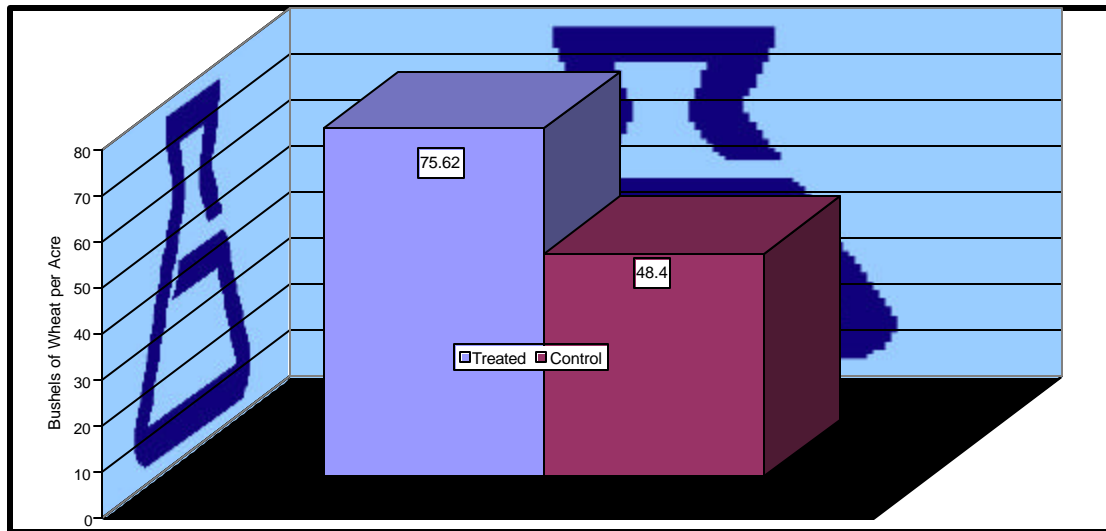


Figure 1. The yields, in bushels of wheat per acre, of the control and treated plots. The values are of a single harvest sample. The treated plants received three quarts of M-P-A WT™ per acre added to the regular planting-time fertility program.

TILLERS PER PLANT

The number of tillers was counted at stooling on October 20, 1993. Three sites were randomly chosen in each of the control and treatment plots. Twenty (20) plants were chosen at each location and the tillers counted per plant.

Average Number of Tillers per Plant (See Figure 2.).

Treated (Plot A): Average number of tillers = 12.78. ¹

Control (Plot B): Average number of tillers = 7.5.

COLOR DIFFERENCES

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

Plots A & B both were tested for test weight. Both plots were graded as number 1.

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

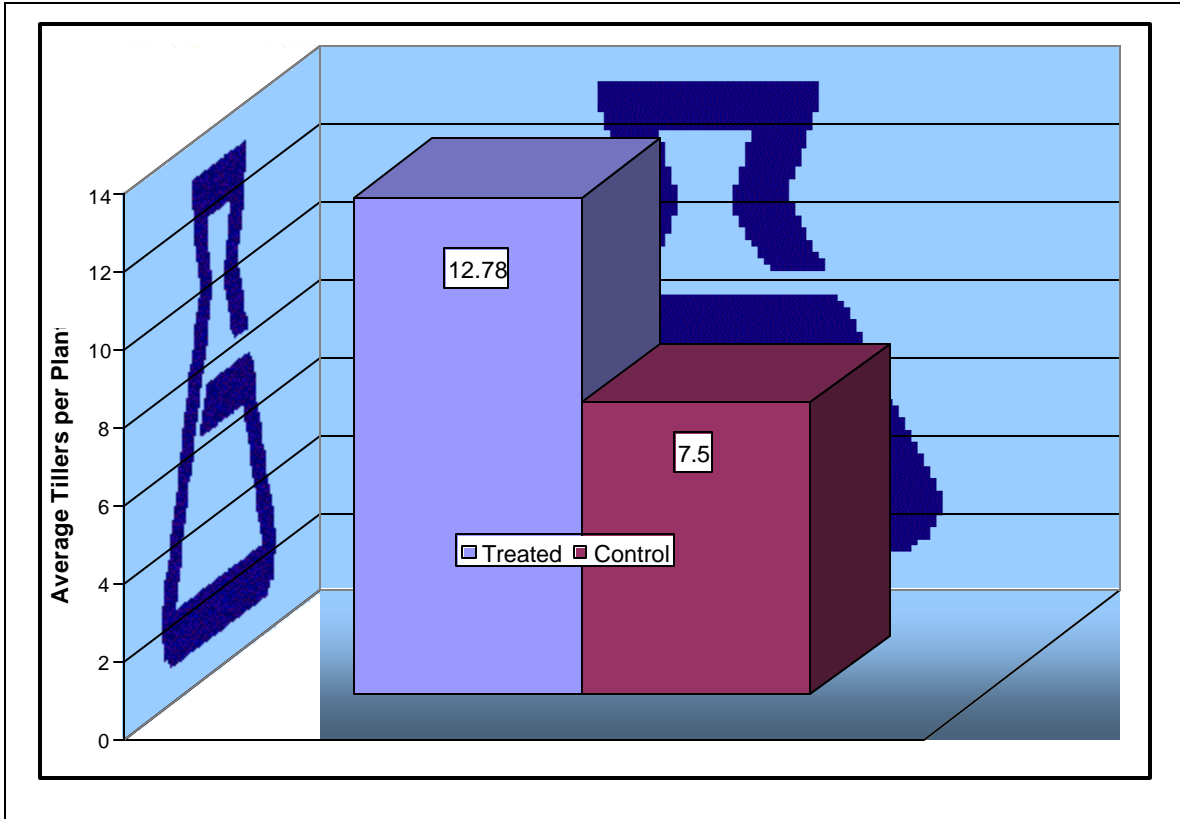


Figure 2. Differences in average number of tillers per plant. Treated received three (3) quarts of MPA WT™ per acre whereas the Control received none.

DISCUSSION

At mid-season, the numbers of tillers in the treated plants were greater than in the control. The yield of the treated Plot A was significantly greater than the control ($P < 0.001$). This study in its first year showed increased yields without altering quality as test weights demonstrated.