



## Objective

1. Determine if NEB-26 will increase yield while maintaining the commercial grade of potatoes.
2. Reducing nitrogen fertilizer 50% was NOT tested in this research. An equal amount of fertilizer was applied to both the control and the treated areas.

## Research

The study was conducted by Michael Sun, PhD Montana State University and the Director of the Montana State Seed Certification Program at Montana State University

## Method

Liquid NEB-26 was applied directly to the soil. The purpose of this study was to measure increased yield, not reduction in nitrogen application. Fertilizer was applied to both the control and the treated areas at the same rate.

## Results

	Control	NEB-26	Increase
Yield (lbs. per plot)	60.43	70.55	116.7%
Grade (#1 grade potatoes)	65%	71%	—

## Comments

1. The objective of significantly increasing the yield of potatoes was successfully accomplished.
2. The commercial grade (quality of potato) increased on the potatoes treated with NEB-26.

## Conclusions

Quote from Michael Sun, PhD Montana State University and the Director of the Montana State Seed Certification Program at Montana State University:

*“Potatoes grown with NEB-26 treated soil produced an increase in yield when measured as a direct comparison. Samples weighed from plots grown with NEB-26 produced a yield increase of 16.7% as compared to the check. The grade improved with an increase of 6% more #1 potatoes.”*



## Extension Service

Seed Potato Certification Program  
Potato Laboratory | Plant Growth Center

Department of Plant Pathology  
Montana State University  
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A yield trial on potatoes was conducted with NEB-26 during 1995. The trial was conducted by Montana State University in a prominent potato producing area located west of Bozeman, Montana. A summary of the study is presented in the abstract with the results available in the conclusion section.

### ABSTRACT:

NEB-26 was spray applied in randomized Latin square block design study. All plots were incorporated after application. Potatoes, Russet Burbank variety, were planted on May 23, 1995 with 12 inches spacing with 3 feet between rows. Fertilizer was applied prior to planting at the recommended rate. Potatoes were hilled and weeded by hand. Potatoes were harvested on September 22, 1995. Grading was conducted by an experienced USDA potato grader as the potatoes were harvested.

### CONCLUSIONS:

Potatoes grown with NEB-26 treated soil produced an increase in yield when measured as a direct comparison. **Samples weighed from plots grown with NEB-26 produced a yield increase of 16.7% as compared to the check. The grade improved with an increase of 6% more #1 potatoes.**

For additional information regarding this study please refer to the complete report.

Sincerely,

Mike Sun, PhD  
Potato Certification Laboratory

YIELD STUDY

ON

POTATOES

WITH

NEB-26

MONTANA STATE UNIVERSITY  
BOZEMAN, MONTANA

MICHAEL SUN, PhD  
DIRECTOR, MONTANA SEED  
CERTIFICATION PROGRAM

## ABSTRACT

### Yield and Grade Effects

Yield and grade of potatoes were determined in the field at the time of harvest. NEB-26 improved both the yield and grade as compared to the check with a 16.7% increase in yield and a 6% per cent increase of #1 grade potatoes. The check yielded 65% #1 potatoes while NEB-26 produced 71% #1 potatoes.

## **INTRODUCTION**

### **Statement of the Problem**

NEB-26 has demonstrated benefits in the production of various crops. Can the yield of potatoes be improved by utilizing NEB-26 while maintaining the commercial grade of potatoes?

### **Purpose of this Study**

The objective was to determine the effect of NEB-26 on the yield of potatoes and to measure any direct effect on the grade of potatoes using commercial standards. NEB-26 was applied as a direct comparison to eliminate other variables.

## **MATERIALS AND METHODS**

### **Field Study**

The effects of NEB-26 on yield and grade was designed as a field study with potatoes. The field site was located west of Bozeman in a prominent potato growing area. Water was available through irrigation applied by pivot sprinklers.

The primary objective was a yield comparison with consideration of grade. The study was designed as a randomized block latin square utilizing four replicates.

### **Layout and Application**

The study design included a plot size consisting of 20' x 6' with four replicates. NEB-26 was applied on May 5, 1995. The exact quantity of NEB-26 were measured for each plot, applied by spray and incorporated.

### **Application Rates**

NEB-26 was applied at the recommended rate of one gallon per 15 acres. The check plots were tilled by the same equipment to eliminate any benefits of incorporation to the treated plots.

### **Fertilization**

Fertilizer was applied in the spring in granular form and incorporated prior to planting. Application, per acre, consisted of 220 lbs. of nitrogen, 200 lbs. of phosphorous, 250 lbs. of potassium, 120 lbs of sulfur and 10 lbs. of zinc.

### **Planting**

Potatoes, variety Russet Burbank, were hand planted on May 23, 1995 with two rows in each plot. Spacing was 3' between rows with 12" spacing between seed pieces.

### **Management**

Each potato row was hilled by machine to maintain tuber protection when the plants were approximately 8" tall. Weeds were controlled by hand, on a regular basis, throughout the season. Water was applied, as needed, by irrigation distributed by overhead pivot. The plants were checked after emergence and the stand was uniform and consistent throughout the entire study.

## RESULTS AND DISCUSSION

### Discussion

Soil temperatures were relatively low, 45 degrees, but were consistent with actual field use practices by a commercial grower. By May 22 the soil temperature had increased, at the 6" depth, to 57 degrees, which exceeded the threshold minimum recommended for planting. All tables are included in the Appendix.

### HARVEST

Samples were harvested on September 22, 1995, by hand digging 10' foot long strips from three replicates of each treatment. Samples were collected and weighed on an OHAUS electronic portable scale. All potatoes were measured and inspected for grade by a federal potato grade inspector.

### YIELD AND GRADE


Plots treated with NEB-26 consistently produced a yield increase of potatoes. The final comparison measured a 16.7% increase in potatoes, by weight, as compared to the potatoes grown as a check.


The grade of potatoes increased with NEB-26. Potatoes grown as a comparison yielded 65% #1 potatoes, commercial grade, while potatoes grown with NEB-26 produced 71% #1 potatoes.

**CONCLUSION**

Potatoes grown with NEB-26 treated soil produced an increase in yield when measured as a direct comparison. Samples weighed from plots grown with NEB-26 produced a yield increase of 16.7% as compared to the check. The grade also improved with an increase of 6% more #1 potatoes.

Montana State University  
Potato Certification Laboratory

  
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Mike Sun, PhD

  
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Date



## APPENDIX

### Yield

Treatment	Yield (lbs)	Increase %
C	60.43	----
T	70.55	16.7

Note: NEB-26 produced an increase of 16.7% as compared to the check.

### Grade

Treatment	#1	#2	Grade (%) Undersize	Culls	Total %
C	65	16	15	4	100
T	71	7	17	5	100

Note: NEB-26 produced a yield increase of #1 commercial grade potatoes of 6% as compared to the check.

### Legend

C Check  
T NEB-26

Resume for  
**Mike K. C. Sun**  
**Seed Potato Certification Program**  
**Montana State University-Bozeman**

**EDUCATION**

Ph.D. in Plant Pathology, North Carolina State University, January 1979.

**EMPLOYMENT**

March 1978 to Present - Montana State University

Position/Titles: Extension Plant Pathologist, Director of Seed Potato Certification and Seed Potato Improvement Program, 1993 to present; Associate Professor, 1984-1992; Assistant Professor, 1978-1983; Executive Director of Montana Potato Improvement Association, 1978-present. Responsibilities: In charge of all aspects of the Montana Seed Potato Certification and Improvement Program.

August 1976-February 1978. Michigan State University

Position: Employed as a Postdoctoral Research Associate in the Department of Botany and Plant Pathology. Working on the etiology, biology, characterization and control of virus diseases of small fruits (grapes, blueberries, strawberries and raspberries).

September 1975-July 1976. North Carolina State University

Position: Associate Plant Pathologist in the Department of Plant Pathology. Worked on "International *Meloidogyne* Project" (IMP) funded by USAID. (Study leave).

September 1973-August 1975. The Asian Vegetable Research and Development Center

Position: Associate Plant Pathologist. Responsible for virus and nematode disease problems. Directed a group of 10 people (3 Research Assistants with M.S. degrees, 2 Field Assistants and 5 laborers) to work on screening of germplasms for resistance to virus and nematode diseases, and in cooperation with breeders in breeding for disease resistance.

February 1971-July 1973. North Carolina State University

Position: Employed as a Postdoctoral Fellow. Worked on epidemiology and control of virus diseases of potatoes in tobacco.

**PROFESSIONAL ACTIVITIES**

Member of Potato Association of America

Chairman, Executive Committee of the Certification Section (1985-86)  
Vice Chairman, Executive Committee of the Certification Section (1984-85)  
Director of the Executive Committee of Certification Section (1983-85).  
Chairman of the Committee for Reviewing Potato Inspection Standards, appointed by the Certification Section (1983-1985).

Member of Review Committee For Western Regional IPM for Potato Project (1986 to 1988)

Member of the American Phytopathological Society

Chairman of the Western States Certification Agencies (1982-1983)

Secretary of Western States Certification Agencies (1980-1982)

Member of the Society of Nematologist (1973-1976)

Sigma Xi (1972-75)

**AWARD**

Montana Seed Potato Growers Award, 1985

Researcher of the Year, 1994, National Potato Council