



# MINISTRY OF AGRICULTURE, LIVESTOCK AND IRRIGATION



STATE AGRICULTURE AND LIVESTOCK INSTITUTE, HEHO-DEIMAWSO

## Effect of Different Nitrogen rates on Growth and Yield of Potato (*Solanum tuberosum* L.)



အလူး၏ ကြီးထွားမှုနှင့် အထွက်နှုန်းအပေါ် မတူညီသော နိုက်ထရိုဂျင်  
နှုန်းထားများ၏ သက်ရောက်မှုများ

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# Introduction

## Potato



➤ Carbohydrates, high concentrations of vitamin C, B6, essential amino acids (glycine, arginine, methionine)

➤ one of the most important crops globally

**(Tekalign, 2005; FAO, 2008)**

➤ 4th ranking being the most cultivated food crops after wheat, rice and maize

**(FAO, 1995; FAOSTAT, 2012)**

## **In the world,**



- total potato cultivated area - 18,132694 ha
- Production - 359 million MT
- Average yield per ha - 25 ton

(FAOSTAT, 2021)

## **In Myanmar,**



- total potato cultivated area -16215 ha
- Production - 450116 ton
- Average yield per ha - 15.45ton

(DoA,2022)

# Effect of Nitrogen in Potato



- critical for optimizing potato yield quality

(Naruka, 2017)

- amino acids, proteins, enzymes, co-enzymes

- adequate amount of N stimulates rapid growth, root growth-leads to high yield

(Evans, 1989)

- variety, environmental conditions, cultural practices- fertilizer application - prominent effects on the yield

(Westermann, 2005)



## Nitrogen Deficient Symptoms



- Potato leaves - pale yellow green, small in size, drop prematurely (Burke, 2017)
- Plant - stunted in growth with only a few thin stems (GetuBeyene,1998)
- Yields - as low as few tubers are formed

(Hughes,1978)

## Nitrogen Excessive Symptoms

- Poor root development
- Leaves may roll and deform ,
- development of canopy ,delay tuber initiation, delay tuber maturity

(Ephytia,2023)

# Objectives

The students are able to

- To improve soil fertility through nitrogen cultivation at State Agricultural University, Iloilo
- To share knowledge on the use of nitrogen fertilizer in the field (student center)



## Materials and Methods



## Experimental Site

- Field of Heho SAI (Kalaw Township),  
Southern Shan State
- Sowing Date – 24 June, 2023
- Harvesting Date – 11 September, 2023

## Experimental Layout

- Design RCB with 4 replication  
( with 4 Student Group-Group A,B,C,D)
- Tested Cultivar- Markies (OK size- 41-50mm)
- Plot Size- 3.6 m x 3.75 m = 13.5 m<sup>2</sup>
- Plant Spacing- 30 cm x 75 cm

## Experimental Site



# Treatments

## 4 Levels of Nitrogen Fertilizer

**T1-N 0 kg / ha**

**T2- N 80 kg/ha**

**T3-N 160 kg/ha**

**T4-N 240 kg/ha**

# Fertilizer Application



Cow dung manure (15 t/ha) application (as  
**Chemical Fertilizer Application**)



K<sub>2</sub>O 300 kg/ha and P<sub>2</sub>O<sub>5</sub> 200 kg/ha were applied  
at the basal



Four split(source of N) interval were applied  
after growing point

# Data Collection

(1) Plant Height(cm)

(4) Days to 50% flowering

(2) Number of stem per plant

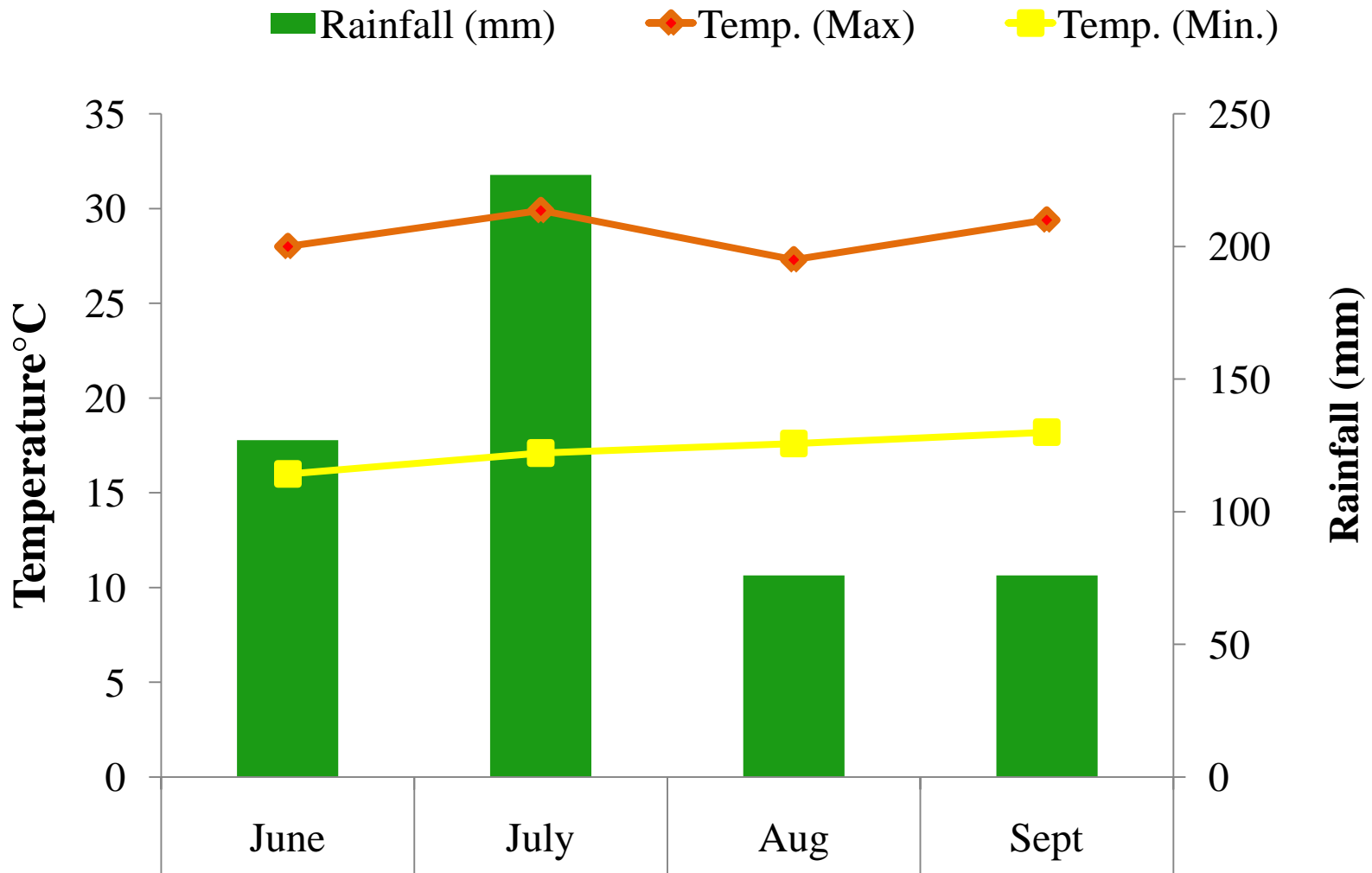
(5) Fresh tuber weight (g) per plant

(3) Number of leaves per plant

# Data Analysis

➤ 10 sample plants/plot

➤ Data was calculated by mean

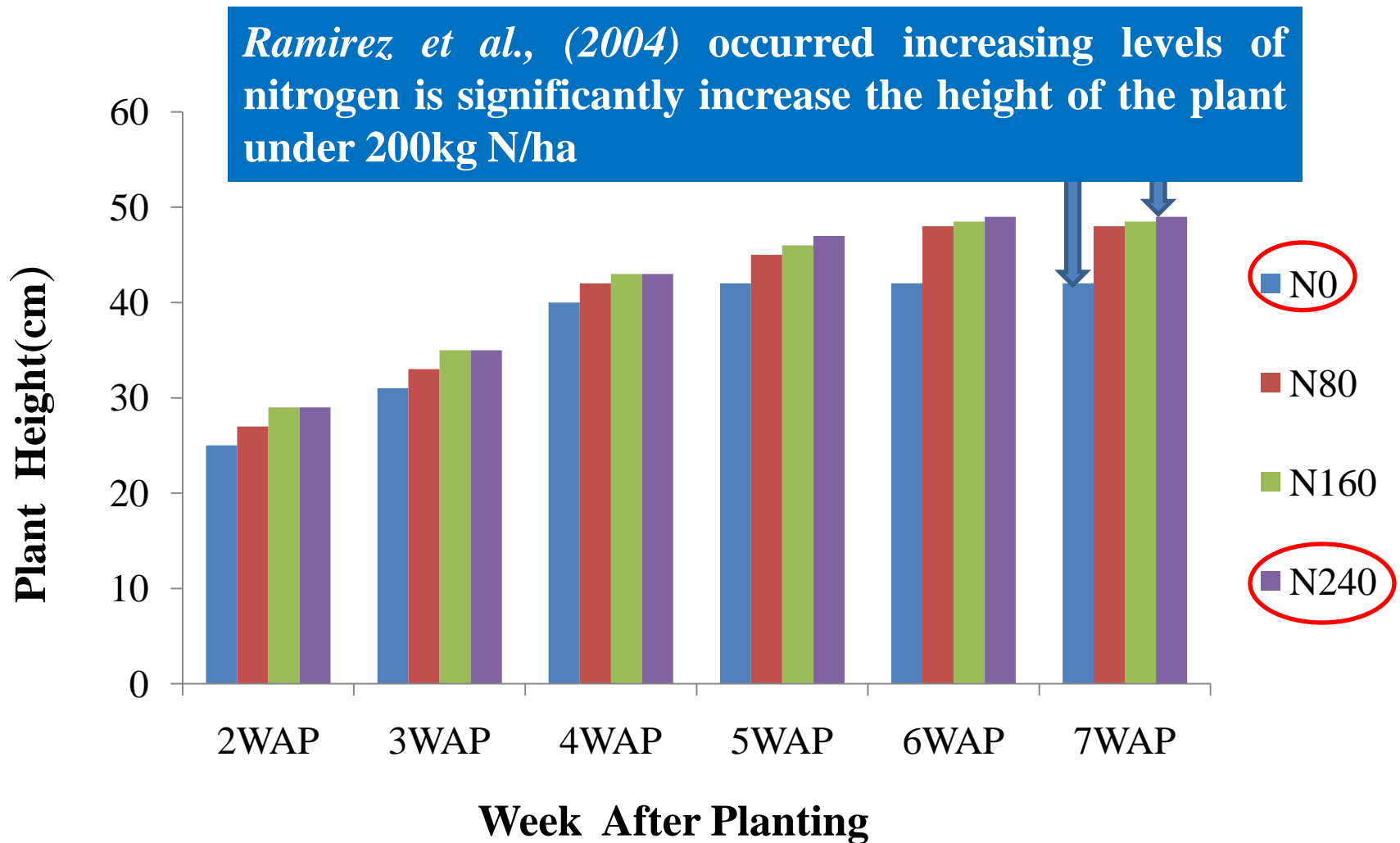


**Figure 1 Monthly average rainfall, minimum and maximum temperature during experimental periods in Heho (June-September 2023)**



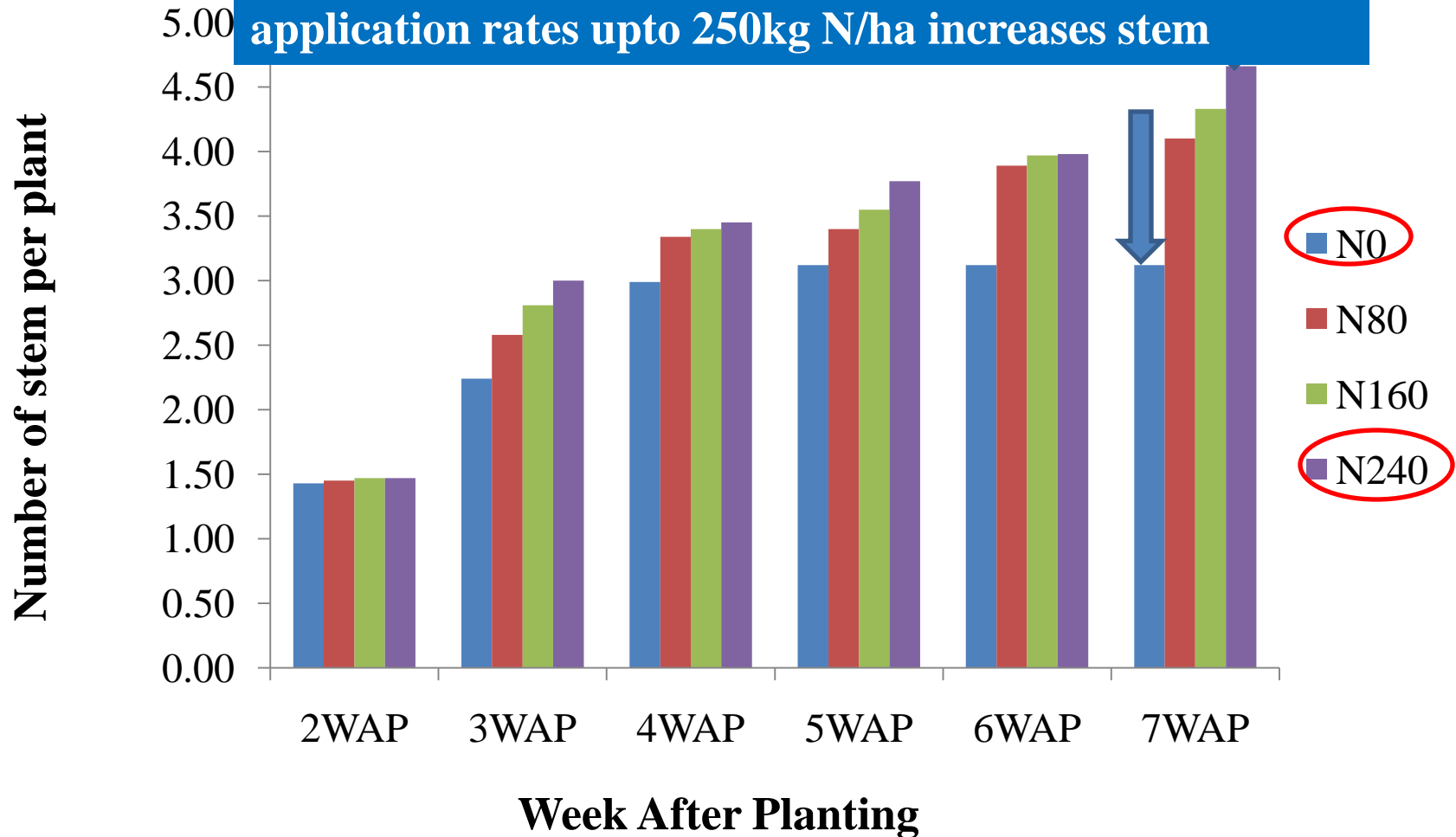
# Results and Discussion





**Figure.2 Comparison of different rates of nitrogen on plant height during rainy season (2023)**

*Anabousi (1997)* reported increasing nitrogen application rates upto 250kg N/ha increases stem



**Figure. 3 Comparison of different rates of nitrogen on number of stems per plant during rainy season (2023)**

Peter et., (2015) reported that both nitrogen fertilizer rates split frequency increased number of leaves per hill.

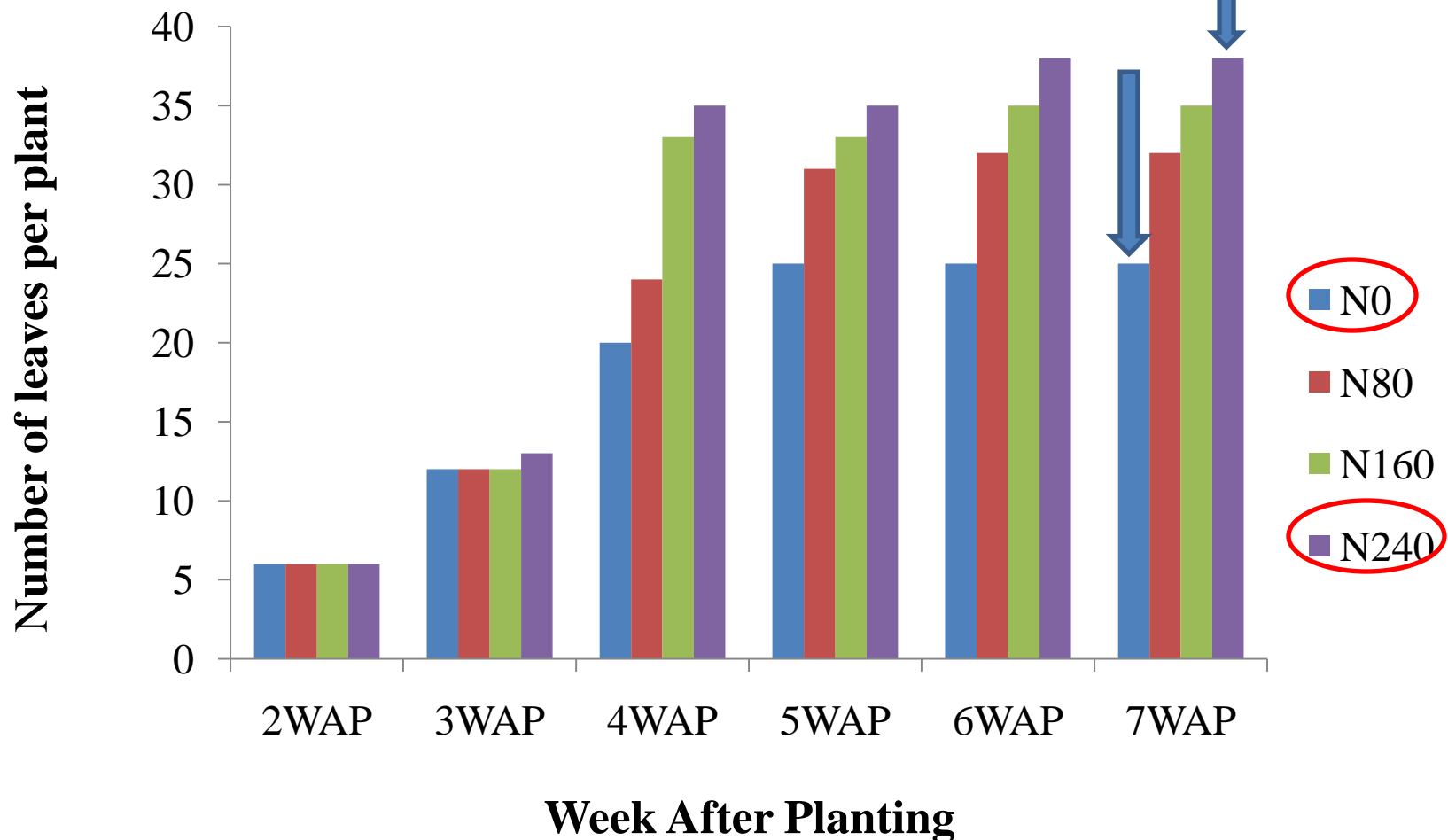
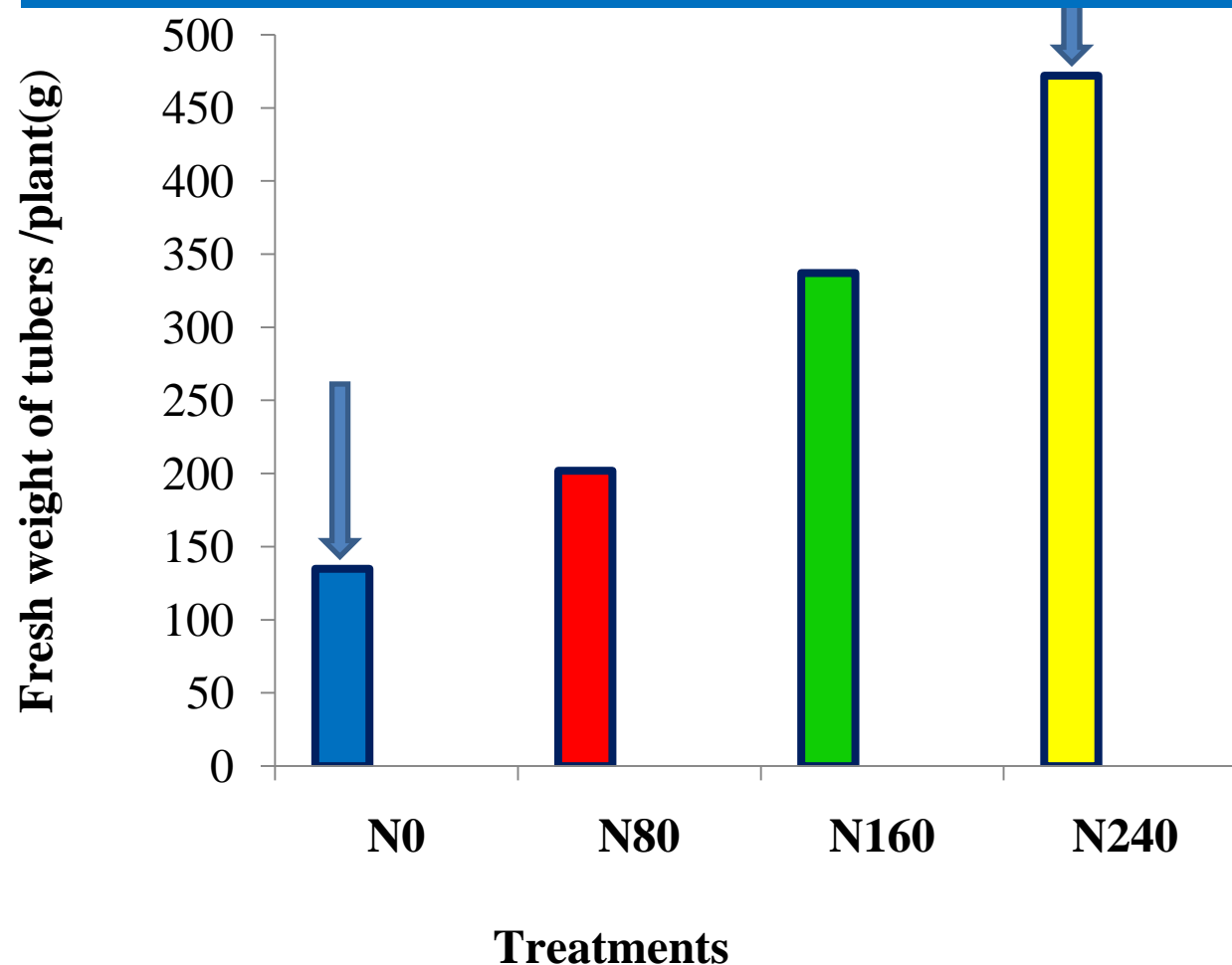


Figure. 4 Comparison of different rates of nitrogen on number of leaves per plant during rainy season (2023)

**Banjare et al. (2014) observed an increase in fresh and dry weight of tuber per plant with increased nitrogen fertility.**



**Figure 6 Comparison of different rates of nitrogen on the fresh weight of tuber /plant(g)**

**Table-1 . Effect of nitrogen rates on the growth and yield of potato**

<b>Treatments</b>	<b>Days to 50% flowering</b>	<b>Total tuber yield t/ha</b>	<b>Marketable yield t/ha</b>
T-1 (N-0)	36 DAP	6	3
T-2 (N-80)	39 DAP	9	7
T-3 (N-160)	38 DAP	15	13.5
T-4 (N-240)	40 DAP	21	20

# Conclusion

240 kg N/ha



the maximum potato tuber yield with corresponding growth parameters

240 kg N/ha



the optimum nitrogen rate for potato cultivation at SALI In Heho  
(Project Time-June-Sept: 2023)

**Present Semester**



**Effects of different rates of K**

**Future Plan**



**Effects of different rates of P and water management, pest and disease management**

## References

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***Thanks for your kind attention***

