Evaluation of Promising NERICA rice varieties under Irrigated and Upland Environmental Condition in PNG.

5th February 2016

Presentation Outline

- Introduction
- Materials and Method
- Results
- Discussion
- General Conclusion

Introduction

- Rice (O. *sativa)* is considered one of the most common daily diet of many Papua New Guineans yet it has not been well adopted into the cultural and traditional farming systems of PNG farmers.

- To date there are less than 50 different rice varieties cultivated throughout the country thus raising concerns that in country with very diverse agro-ecological environments and with the current climate change and other biological and economic factors the number of rice varieties grown is considered low and needs to be increased to meet the different constraints and opportunities.

- In 2011, 78 new varieties of NERICA rice varieties were imported from Benin in West Africa to NARI, Papua New Guinea.

Introduction

- From the Preliminary observation and evaluation, 10 upland and 6 lowland NERICA varieties were recommended for further evaluation under dry environmental condition.

- The major objective of this evaluation was to identify the best performing NERICA rice variety/ies (1) for cultivation under upland rain-fed condition and (2) under lowland irrigated condition in Laloki (PNG).

Materials and Method

- Experimental site: The experiments were conducted at the NARI's Southern Regional Centre (Laloki), Central Province.
- Cultivation: The experiment was conducted between February and July 2015 .
  - **Plot area:** Upland trial 275.2m^2 and 172.8m^2 for the lowland trial.
  - **Cultivars:** 17 varieties which consist of 10 NERICA Upland varieties, 6Lowland NERICA varieties and NR 1.
  - **Spacing:** 30cm x 20cm (17 plants per m^2).
  - **Experimental design:** RCBD with three replicates.
- Fertilizer application: A total rate of 100kg/ha of nitrogen fertilizer was applied in spilt applications at the rate of 60:20:20 Kg/ha
  - **Basal application**
  - **Top dressing**
  - **Final topdressing**
- Measurements: Weekly growth measurements were taken and yield and yield components assessed at maturity stage.
- Statistical analysis : All raw data analysis was processed with MS 2010 Excel spreadsheet and statistical analysis and correlations were done using Genstat, Edition 14.

Results

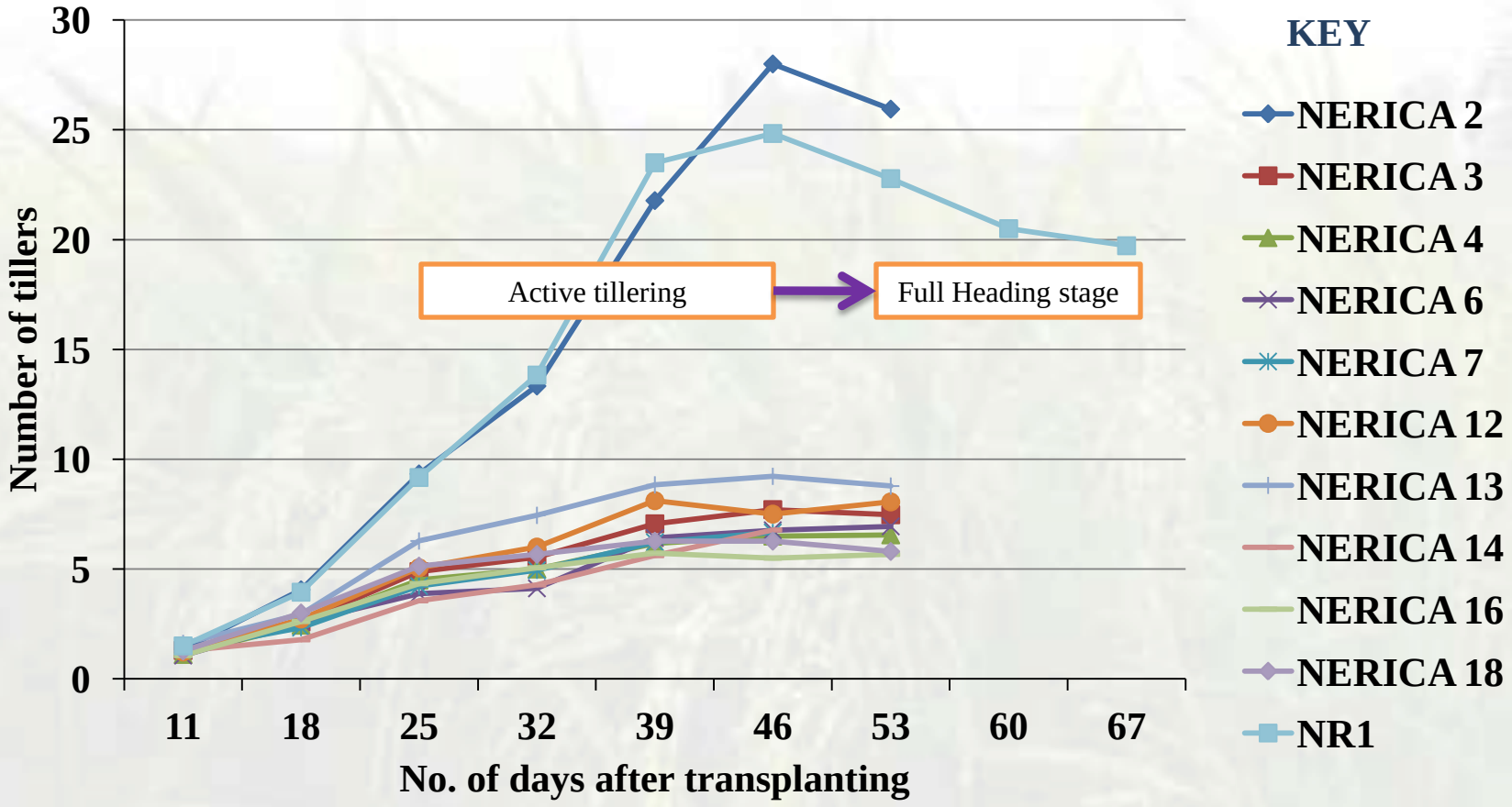

Figure 1: The average number of tiller from 11 days after transplanting to full heading stage in all 10 upland NERICA varieties and NR 1 under Laloki's upland conditions in 2015.

Results

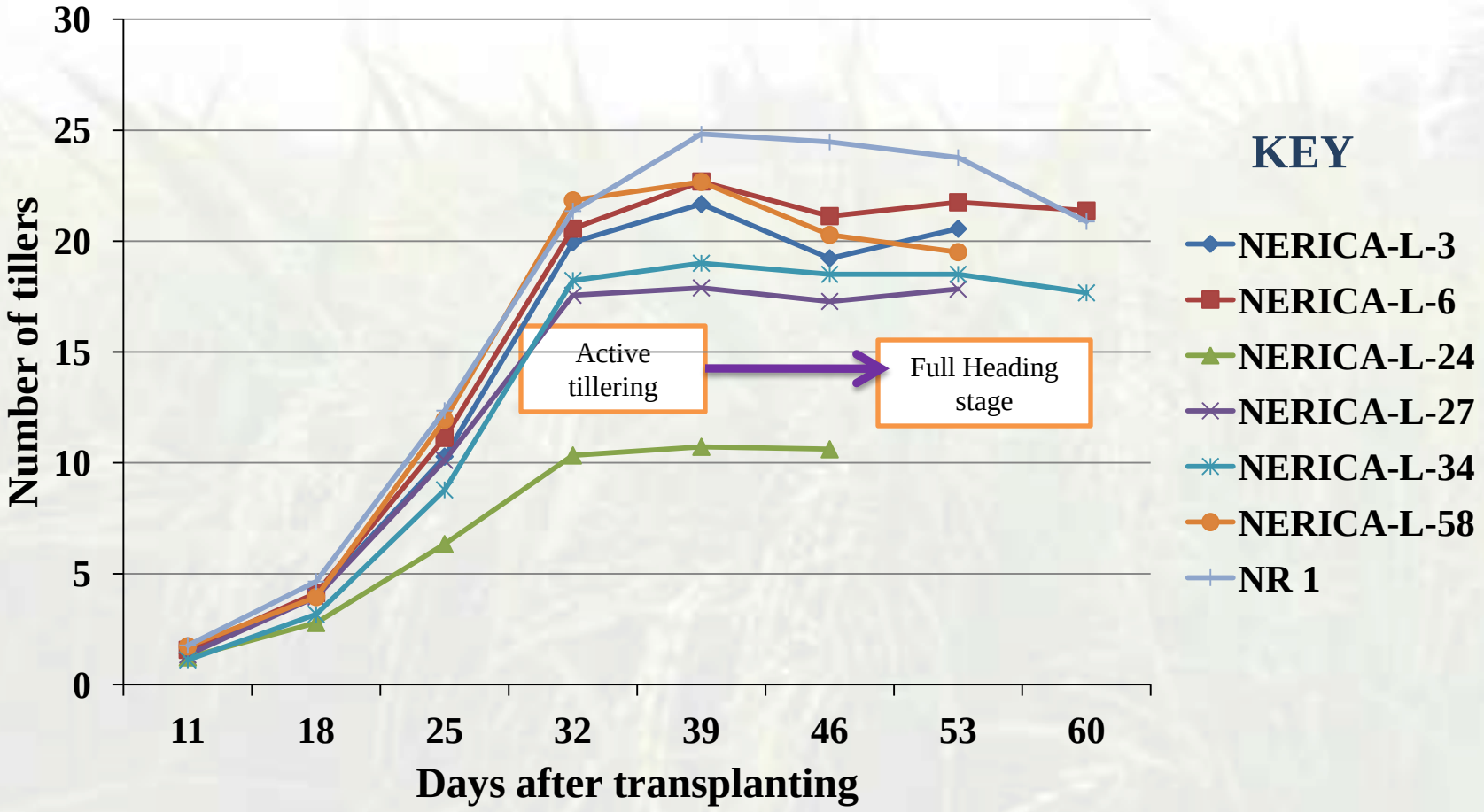

Figure 2: The average number of tiller from 11 days after transplanting to full heading stage in all 6 lowland NERICA varieties and NR 1 under Laloki's irrigated conditions in 2015.

Results

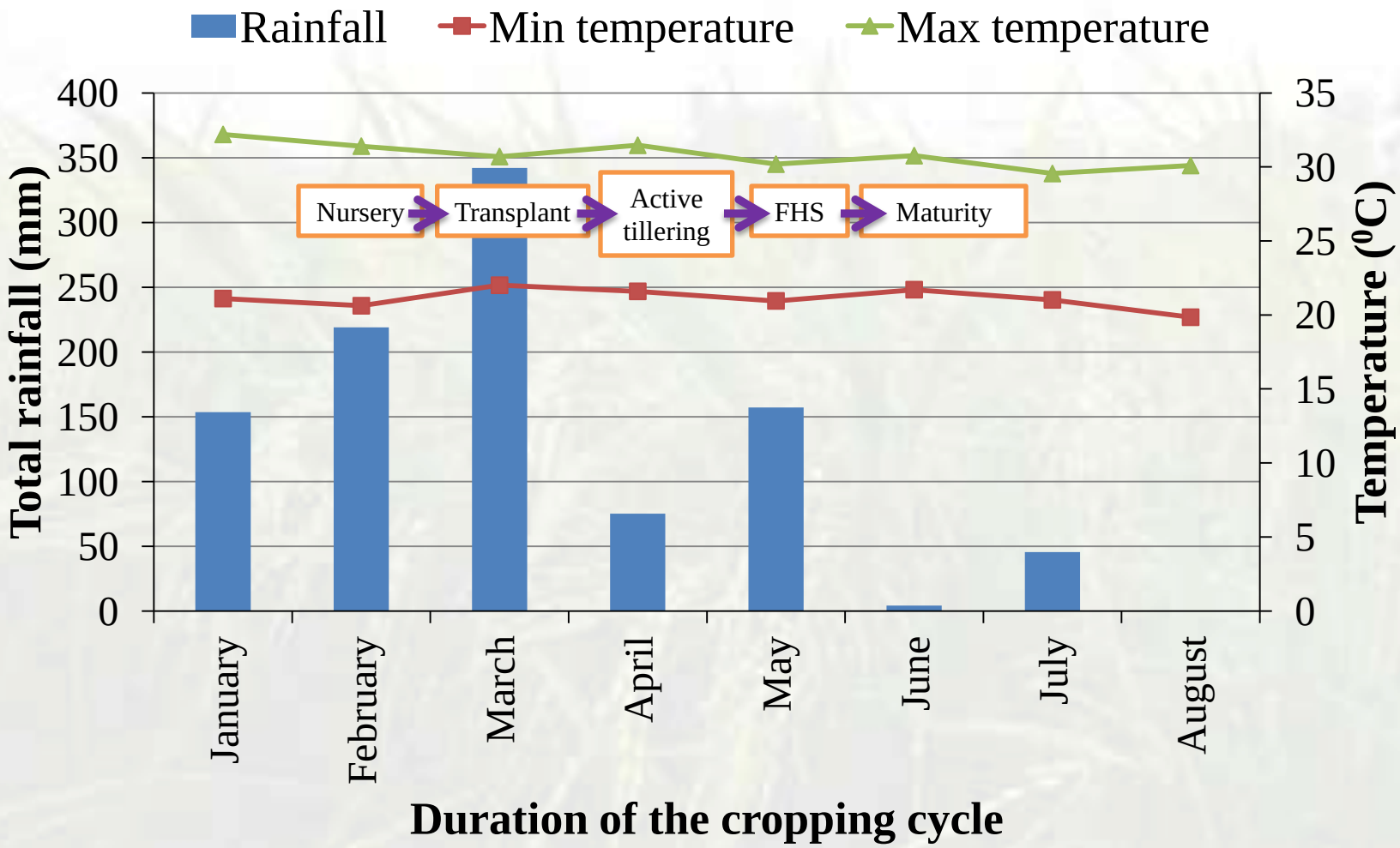

Figure: 3: The rainfall and temperature information throughout the duration of the first AET crop season (2015).

Results

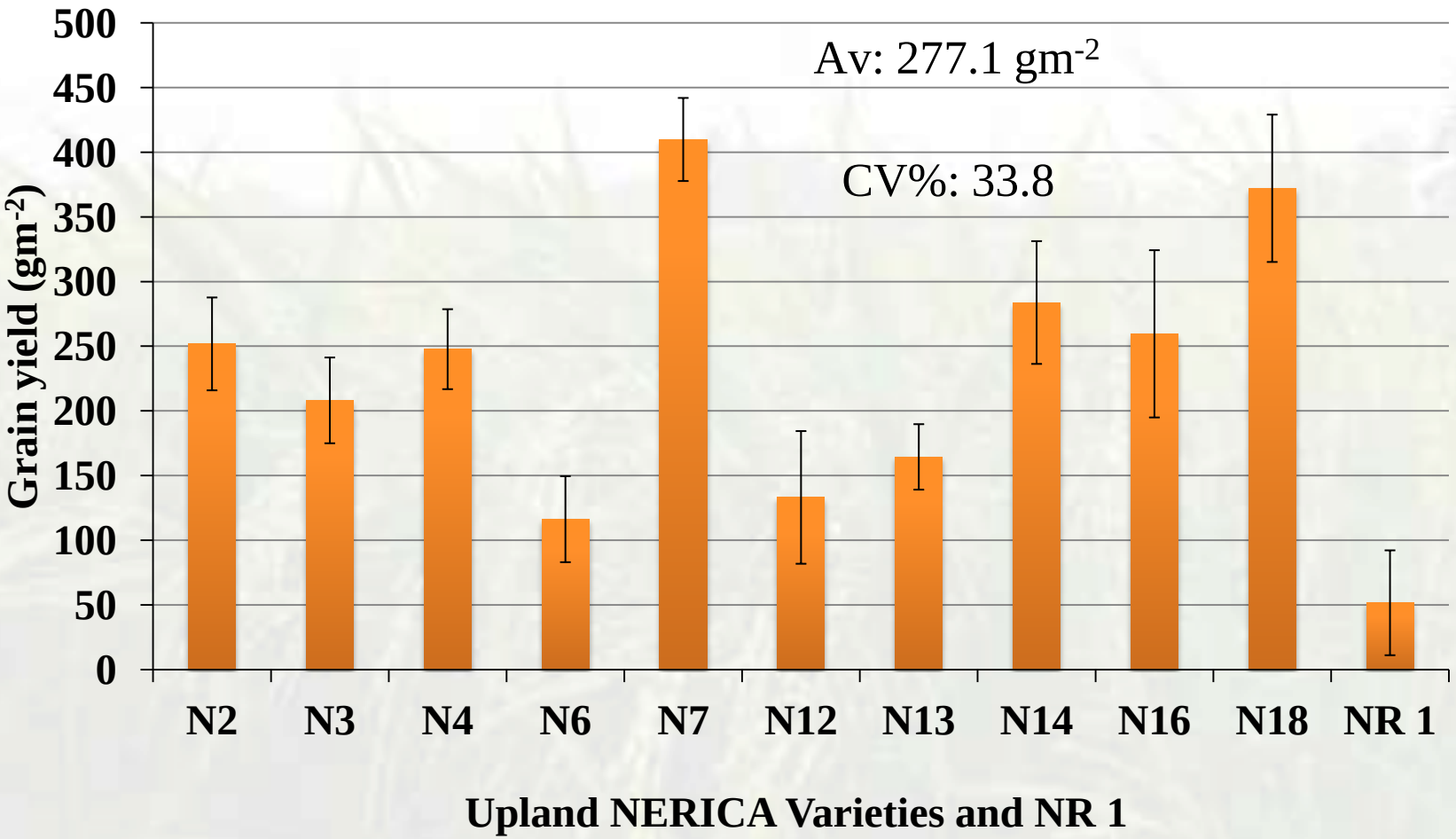

Figure 4: The grain yield (gm^{-2}) of all 10 upland NERICA varieties and NR 1 under Laloki's upland/rain-fed conditions in 2015.

Results

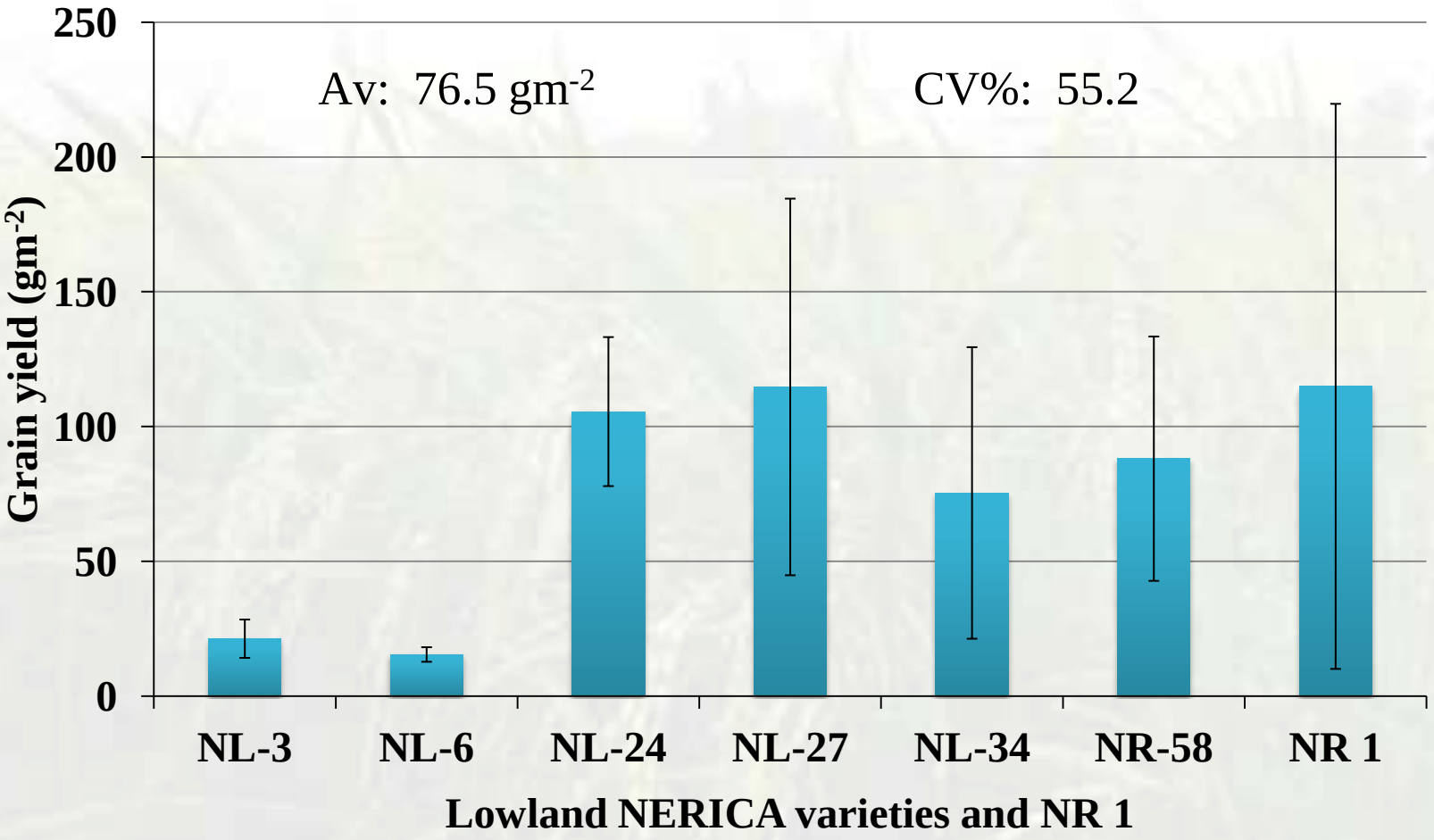

Figure 5: The grain yield (gm^{-2}) of all six lowland NERICA varieties and NR 1 under Laloki's irrigated conditions in 2015.

Discussion

- Both the upland and lowland NERICA varieties adopted well into Laloki's ecological condition and showed promising results of early maturing (Upland varieties (85-90 DAT) and Lowland varieties (85-100 DAT) that is within 100 days after transplanting comparing to NR 1 (116 for upland condition and 100 DAT for lowland condition) and show showed some ability to withstand attack from common rice pest. However, the cold temperatures (<25^0C) throughout their flowering period may have influenced their respective yielding ability especially the lowland NERICA varieties.

General Conclusion

- The actual grain yield and yield components of NERICA 7, NERICA 14 and NERICA 18 were statistically better than the Local check variety NR 1 and all upland NERICA varieties tested during the 2015 cropping season.
- The three best performing or high yielding Upland NERICA varieties (NERICA 7, 14 and 18) should be further evaluated under dry environmental condition to further confirm these results and determine their real potentials.

- The actual grain yield and yield components of all lowland NERICA varieties except NERICA-L 24 and NERICA-L 27 are no better than the local check NR 1 under irrigation condition at Laloki.
- Therefore, the lowland NERICA varieties NERICA-L 24 and NERICA-L 27 should be further evaluated under irrigated condition to confirm their real potentials.

Thank you