

Establishing sustainable solutions to cassava diseases in mainland Southeast Asia

Final Review Hung Loc Agricultural Research Center (HLARC)

Objective 4: Develop and evaluate economically sustainable cassava seed system models for the rapid dissemination of new varieties and clean planting material to farmers in different value chains and production contexts

Alliance



Objective 4 in HLARC

- ✓ **Activity 1: The effects of water availability on cassava yield and starch accumulation.**
- ✓ **Activity 2: Effects Planting Density on cassava yield and starch accumulation**
- ✓ **Activity 3: Susceptibility of Cassava Varieties to Cassava Mosaic Disease Trial**
- ✓ **Activity 4: Rapid multiplication by tunnel system**

Activity 1: The effects of water availability on cassava yield and starch accumulation (Dong Nai province).



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- International Climate Initiative (IKI), German Federal Ministry for the Environment

OBJECTIVES

- ❖ Evaluate the impact of supplemental irrigation water on yield and starch content of cassava plants.
- ❖ Optimize economic benefits in irrigated cassava production by choosing harvest time



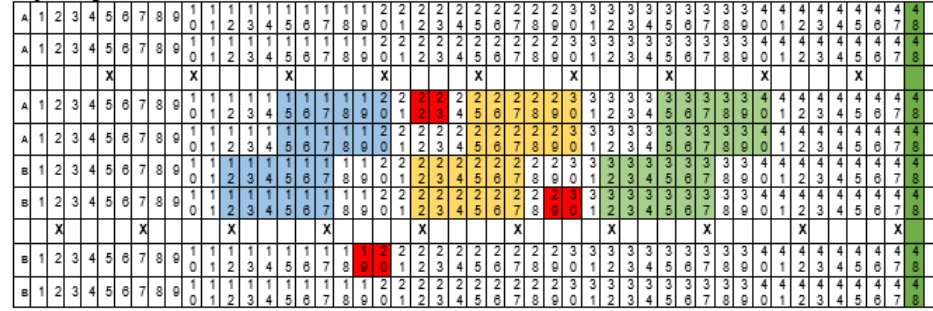
I. MATERIAL AND METHOD

- Location: Hungloc Agricultural Research Center, Dongnai province
- Duration: 2019 - 2021
- Varieties: KM94 (a.k.a KU50) and D7
- Experimental design: Split-plots with 4 replications.
- Density: 1m x 0.8m (12,500 plants/ha).
- Recorded Indicators:
 - ✓ The Length of Stem with and without green leaves (*cm*)
 - ✓ The Fresh Stem and Leaves Yield (*Tons/ha*), Fresh Tubers Yield (*Tons/ha*), Harvest Index (%)
 - ✓ Starch Content (%)

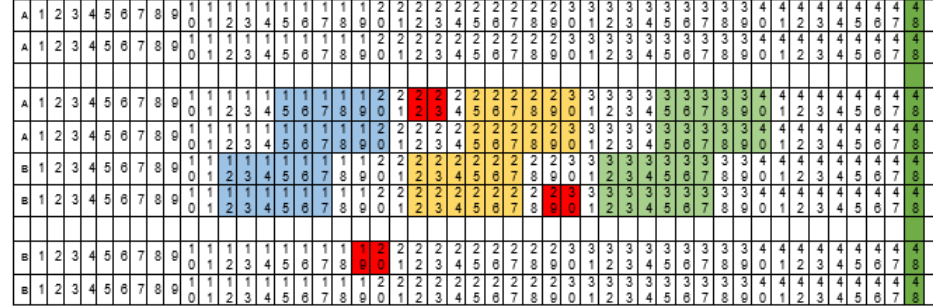


Fig 1. Land preparation (*April 2020*)

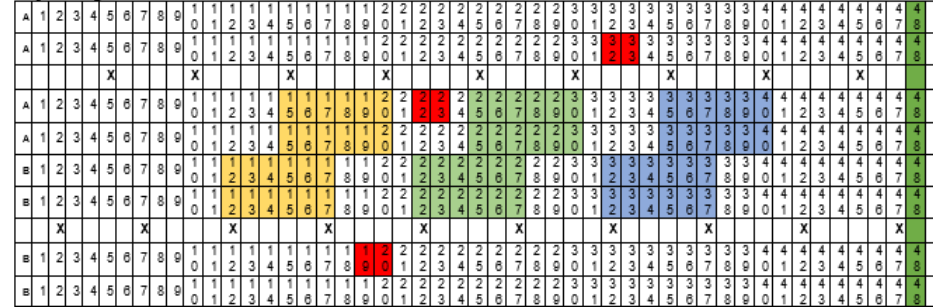
Rep 1: Irrigation



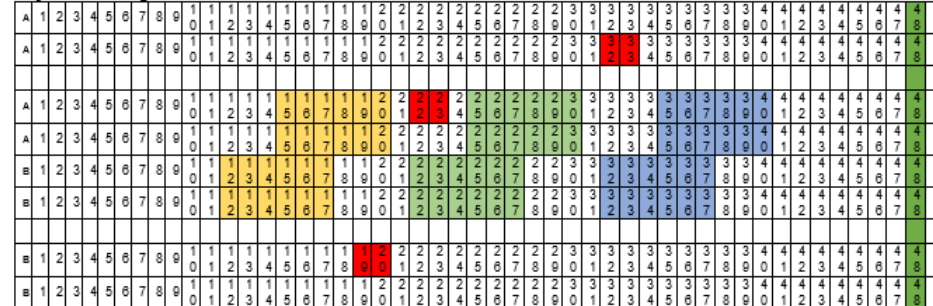
Rep 1: NON-Irrigation



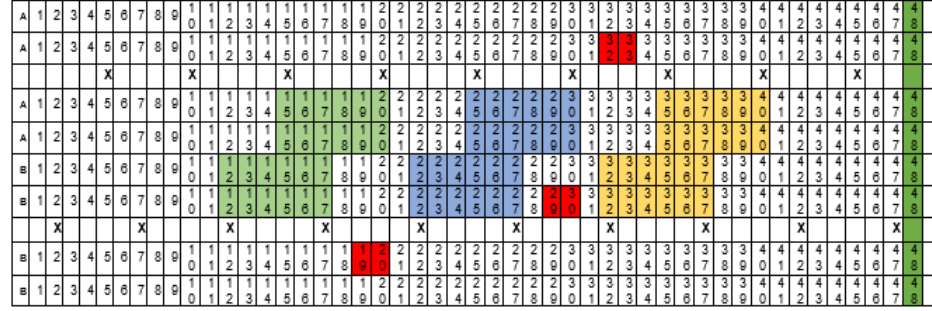
Rep 3: Irrigation



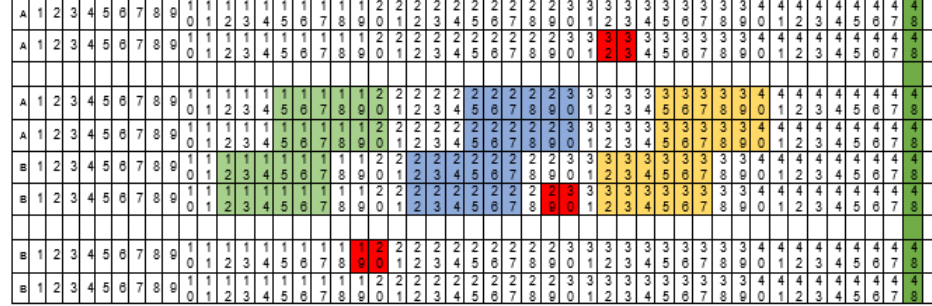
Rep 3: NON-Irrigation



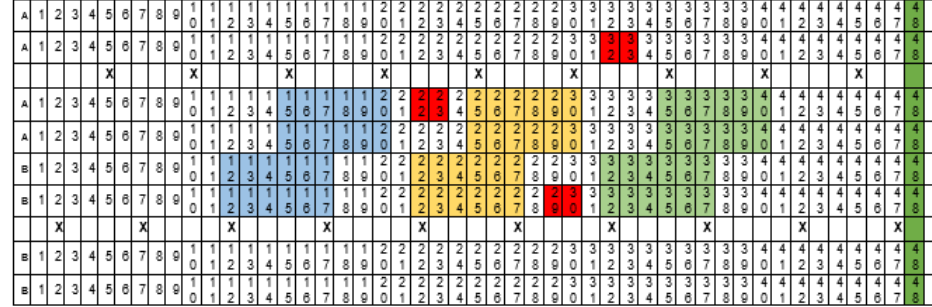
Rep 2: Irrigation



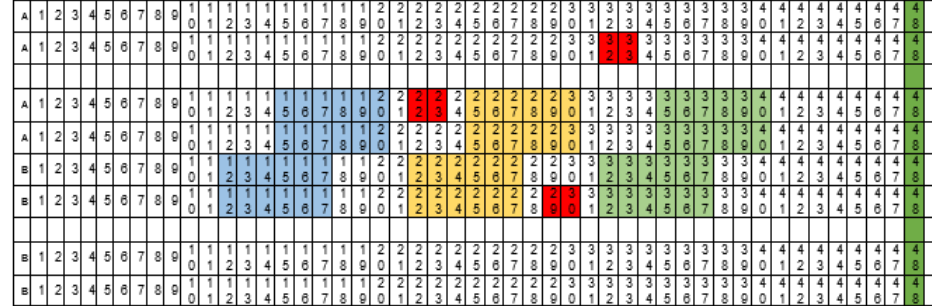
Rep 2: NON-Irrigation



Rep 4: Irrigation



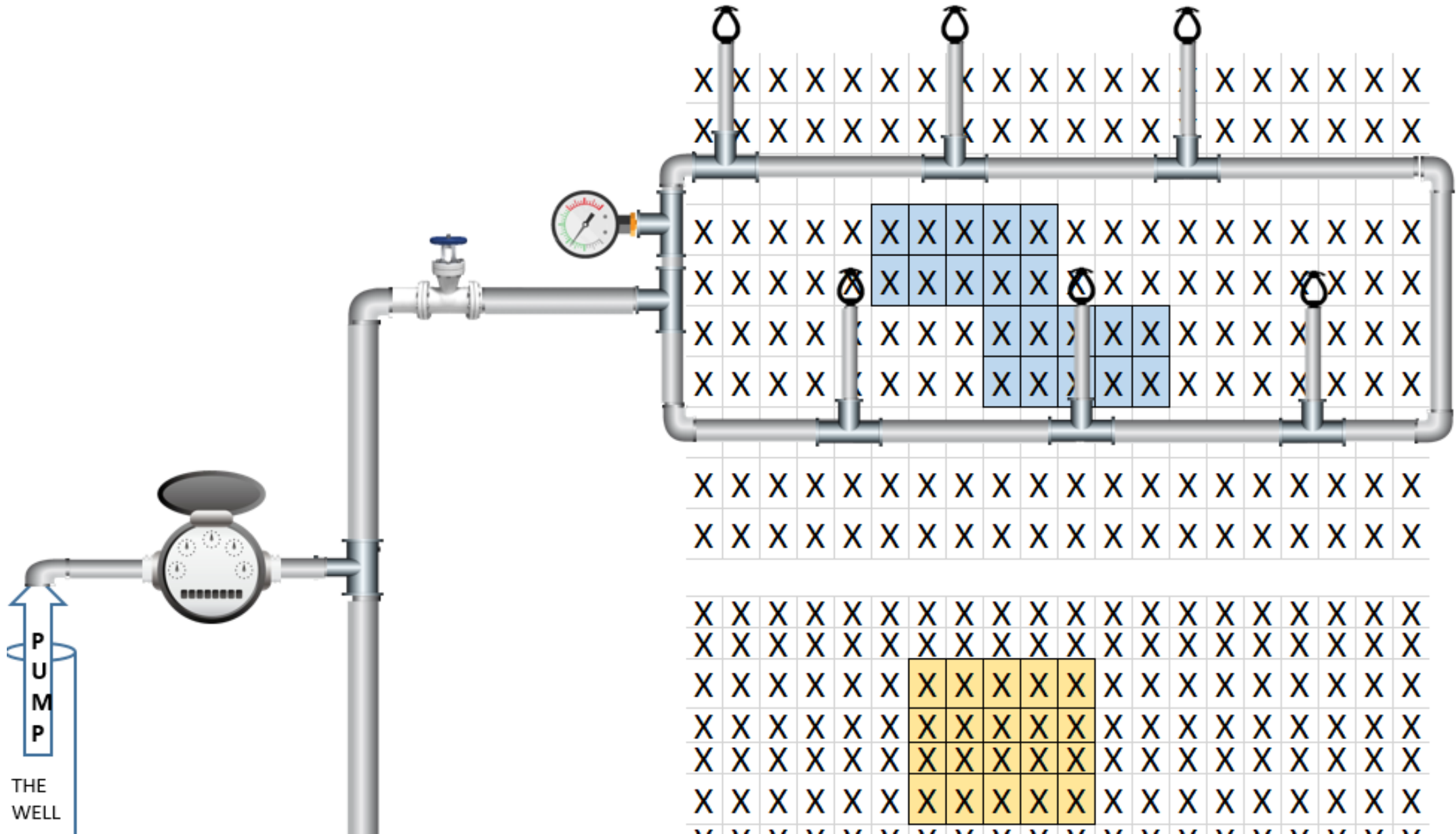
Rep 4: NON-Irrigation



	Harvest 1
	Harvest 2
	Harvest 3
	Non harvest
X	Sprinkler
	Soil moisture sensor

Fig 2.
The
Planting
map

Fig 3. IRRIGATION SYSTEM



**Fig 4. IRRIGATION DATA
AUTO-RECORDING**



**Fig 5. SOIL MOISTURE DATA
AUTO-RECORDING**

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II. RESULT AND DISCUSSION

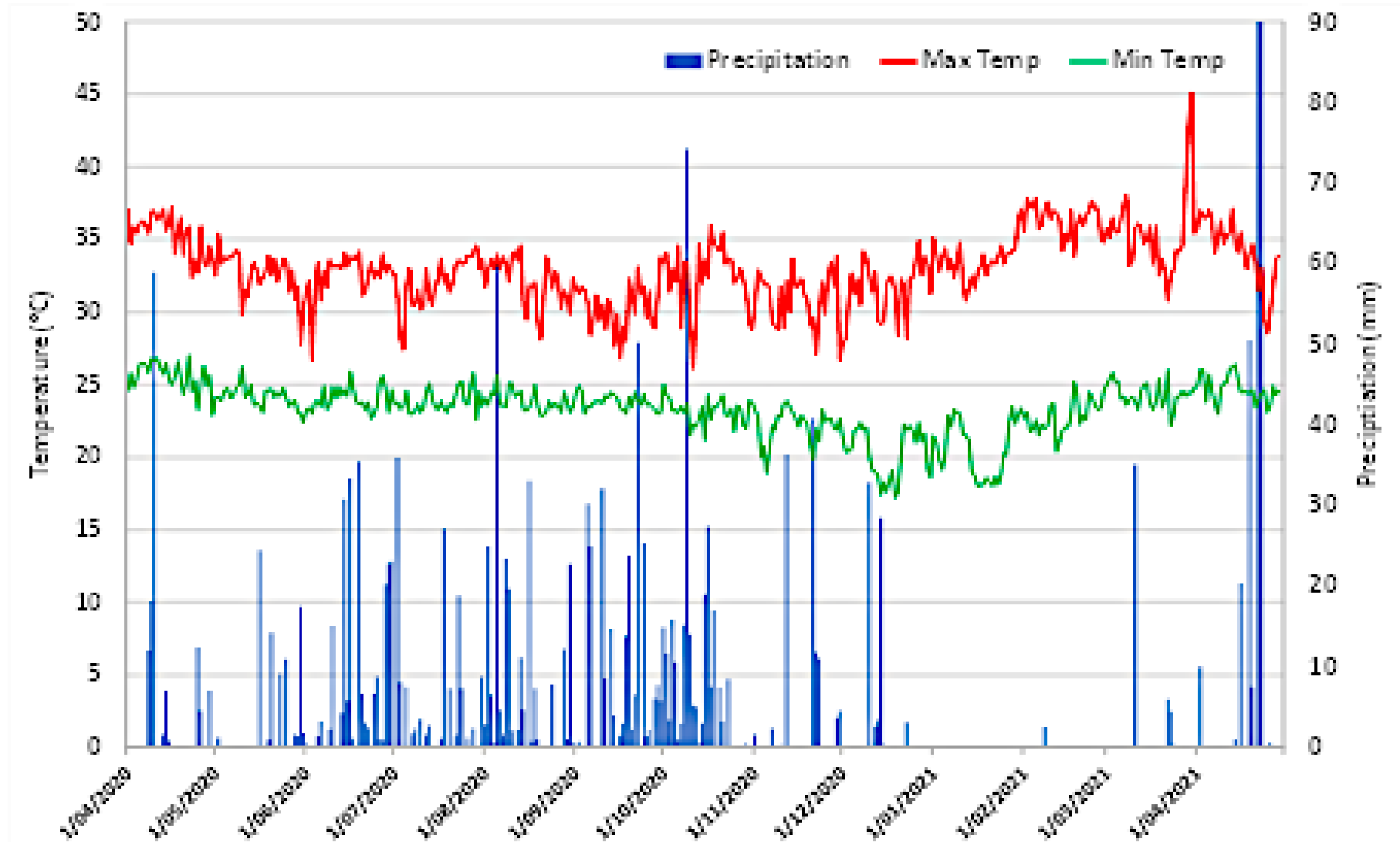
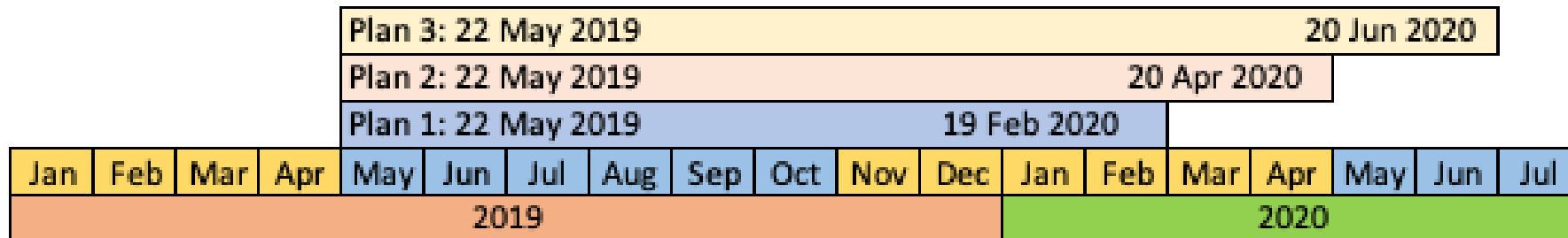
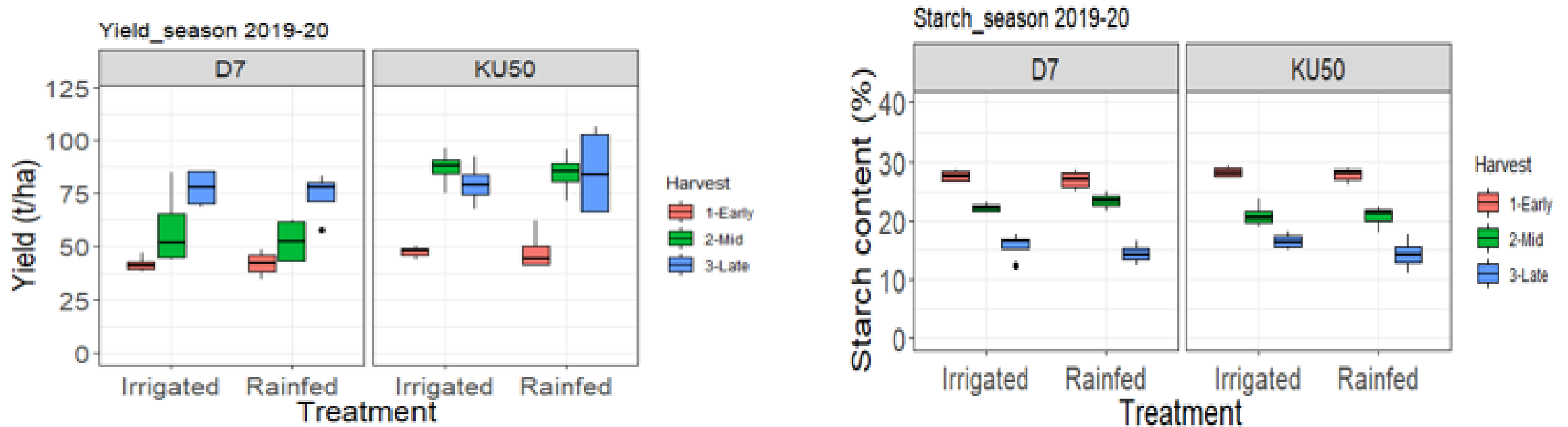


Fig 6. Temperature and precipitation pattern at HLARC- experimental site

II. RESULT AND DISCUSSION

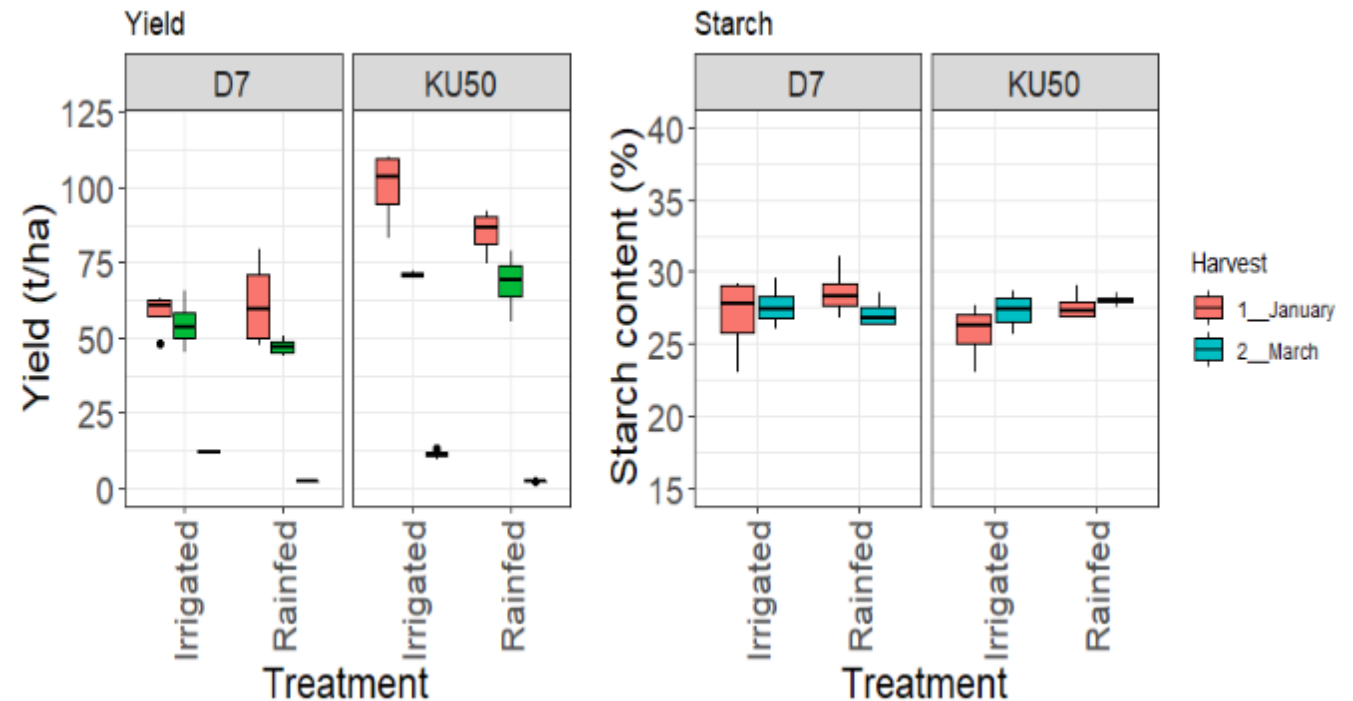
Fig 7. Effect of irrigation water on yield and starch content of cassava in the 2019 - 2020 crop season



II. RESULT AND DISCUSSION

Fig 8. Effect of irrigation water on yield and starch content of cassava in the 2020 - 2021 crop season

Harvest plan	Rainfall	Irrigation
Plan 1	1446 mm	36 mm
Plan 2	1232 mm	51 mm
Plan 3	1230 mm	51 mm



II. RESULT AND DISCUSSION

Fig 9. Visually evaluate harvested cassava plants in the 2019 - 2020 crop season



II. RESULT AND DISCUSSION

2019-2020

- The irrigation treatment did not impact fresh root yield and starch content for cassava varieties KU50 and D7.
- The yields were high due to abundant rainfall and a shorter dry season.
- Irrigated cassava showed uniformity in yield, which aids disease detection.



2020-2021

- Irrigation increased yield moderately (4-18%) compared to rainfed treatment.
- Starch concentration remained consistent at 26-29%.
- The unusual rainfall pattern in the region during the trial period resulted in lower irrigation requirements.



III. CONCLUSION & RECOMMENDATION

- ✓ Irrigation during the dry season can help increase and uniform cassava yields.
- ✓ The plan of planting and harvesting is an important factor that determines the effect of the irrigation.
- ✓ The starch content decreases while the yield increases over time, starting from the earliest harvest.

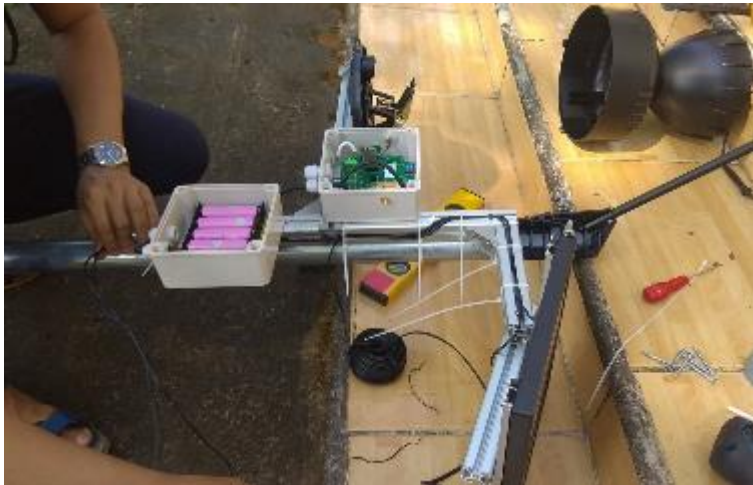
Consequently, farmers can choose the optimal harvest time to meet market demand and maximize economic benefits.

- ✓ Besides, irrigation is important for tunnel-grown plantlets. Comparing experiments of cutting-grown crops and tunnel plant-grown crops was conducted during the 2022-23 season

APPENDIX PICTURES



IRRIGATION AND SENSOR SYSTEM SET UP





CASSAVA GROWTH AND DEVELOPMENT





CASSAVA HARVESTING





THANK YOU FOR YOUR ATTENTION!