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Abstract

This research paper compares the application technology of Good Agricultural Practice (GAP) and farmer's own method on maize (*Zea mays* L.) demonstration plots (demoplots). Maize is a major food crop, grown under subsistence farming with average productivity only 1.5 t ha⁻¹. Ministry of Agriculture and Fisheries (MAF) in partnership with German Cooperation (GTZ, now GIZ) tested a new agriculture technology package to increase maize production in farmer's fields. The research was carried out from November 2012 to April 2013 in 210 of 420 villages from different types of agro-ecological with total of 205 demoplots. Three MAF recommended maize varieties, Sele, NAI and Noi-mutin were used in the demonstration. Each demoplot consisted of 2 treatments, one treatment was GAP technique and the second was normal practices. The large number of demoplots conducted in wide range locations with various management conditions provided a wide range of maize yields. The package was land preparation, plants distance with number of seeds per hole, time and frequency of weeding and pest and diseases control. The result showed that GAP technique increased maize yield by 61% (2.45 versus 1.55 t ha⁻¹ with normal practices). The highest yield was found in Mehara, Lospalos, with 7.71 t ha⁻¹. However, extension service is still considered as a major constraint to promote this technique.

Introduction

Maize (*Zea mays* L.) has been grown by farmers in Timor-Leste for many years. There is no clear evidence that Portuguese introduced maize by the end of 17th century (Fox, 2003). However, Portuguese merchants introduced this crop to Thailand about 400-500 years ago (Jampatang, et. al, 2000). The establishment of trade settlements at Malaka on the Island of Sumatra in 1511, it is likely that maize was introduced around then (Desjardins, 2008) and could link the history of existing maize in the country. In 1699, the adventurer Wallace wrote in this report that maize thrives as a food crop in all the lowland in Timor.

Maize is a major crop in Timor-Leste with more than 100,000 households involved followed by rice (*Oriza sativa* L.) with approximately 60,000 households (TL Census, 2010). Total production annually is between 140,000 – 150,000 Mt from 70,000 – 75,000 ha (NDAH, 2015) with a mean yield of only 2 t ha⁻¹. Some production figures were also dated as a comparison from different period such as 1.0 t/ha (1971) and 1.2 t/ha (1972) in favourable soil and rain in Portuguese time (Thomaz, 2008) and 119,952 Mt (1995) and 122,494 Mt (1996) with maximum only 1.5 t ha⁻¹ during Indonesian period (Benevides, 1998).

Technology packages with high yielding varieties that introduced since Portuguese and Indonesian periods still not changed many farmers' behaviour significantly. Subsistence farming is as a common cultivation practices with low productivity and less income. The introduction of Good Agricultural Practices (GAPs) package could be an option to change farmers' habit from traditional manner to increase maize production. The package is compost with land preparation, plants distance with number of seeds per hole, time and frequency of weeding and pest and diseases control. This technology was developed by the Ministry of Agriculture and Fisheries (MAF) in partnership with German Cooperation (GTZ, now GIZ) to test as a cultivation practice option in farmer's fields in 2012 – 2013.

Materials and Methods

GAPs was a new technology package developed by the Ministry of Agriculture and Fisheries (MAF) in partnership with German Cooperation (GTZ, now GIZ) to test as a cultivation practice option in farmer's fields in 2012 – 2013. The package consisted with land preparation, plants distance with number of seeds per hole, time and frequency of weeding and pest and diseases control. Three recommended varieties were used such as Sele, NAI and Noimutin.

The team selected demoplots sites representing from different types of agro-ecological with 210 of 420 villages. Extension workers were trained to accompany the farmers as demonstrators to test the GAPs package. Each demoplot consisted of 2 treatments, one treatment was GAP technique and the second was normal practices. Farmer Field School (FFS) and farmer field days (FFDs) were conducted to show a new technique application to other farmers. The yield measurement was the big event of FFD to show the two different treatments.

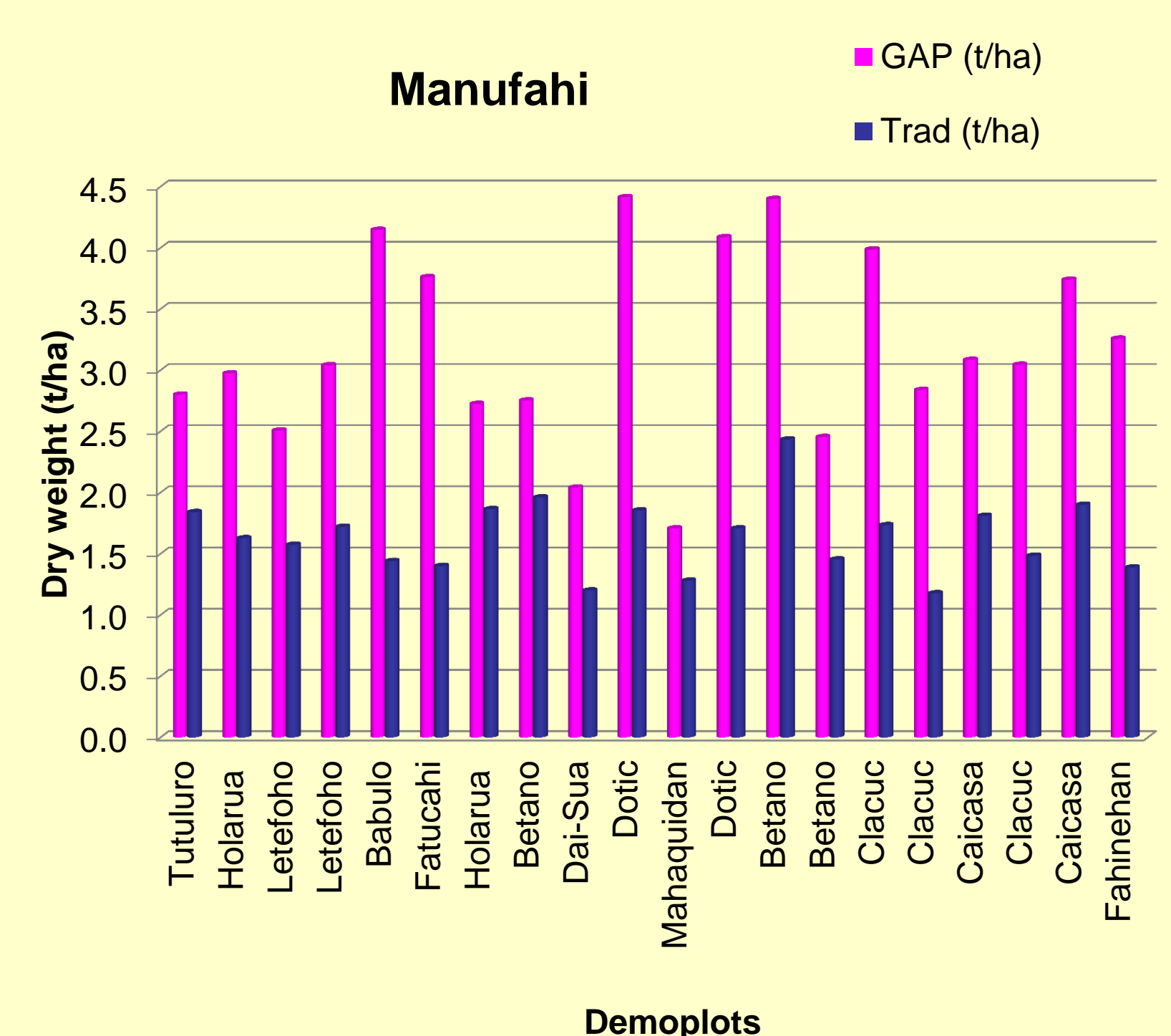
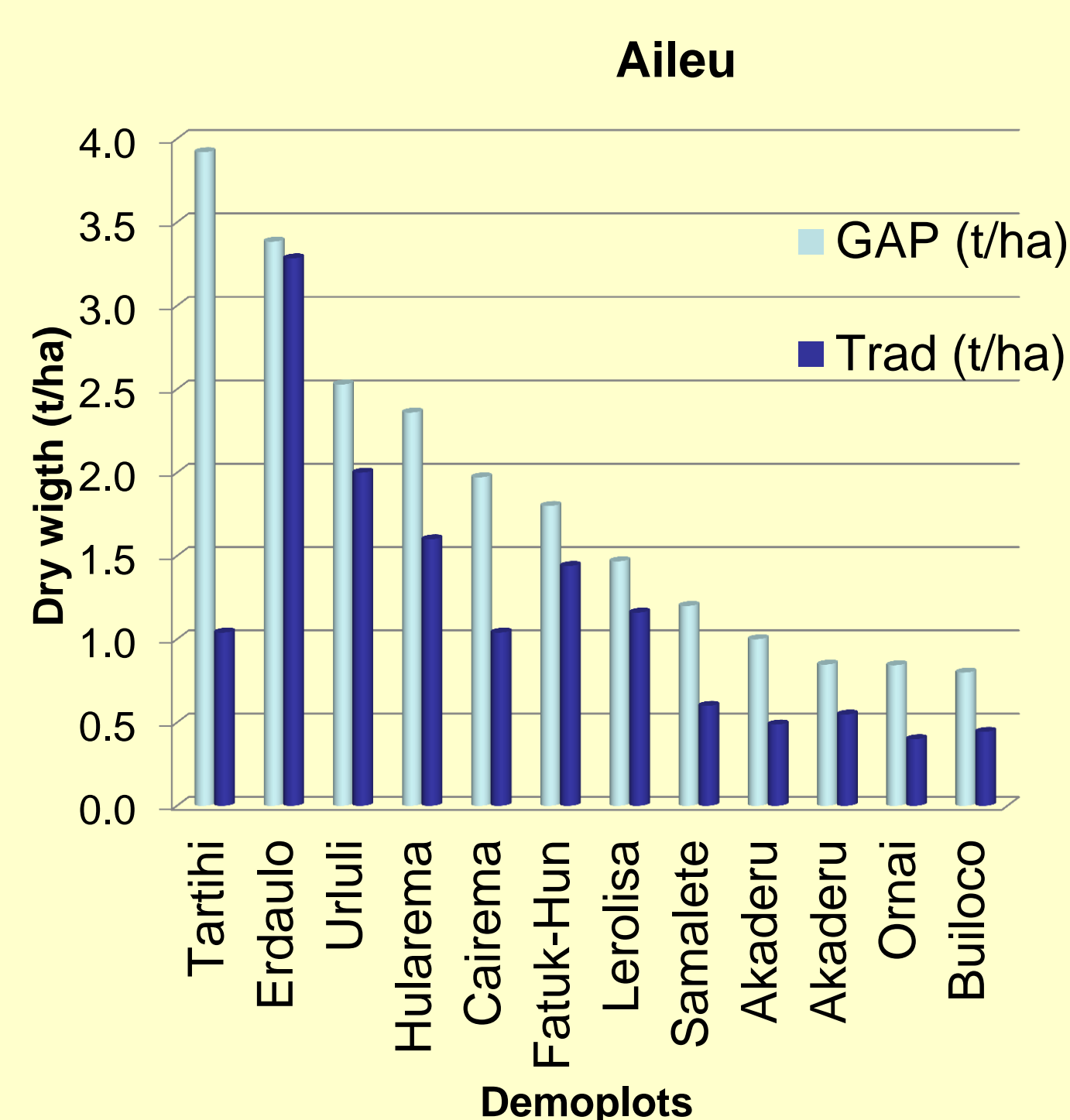
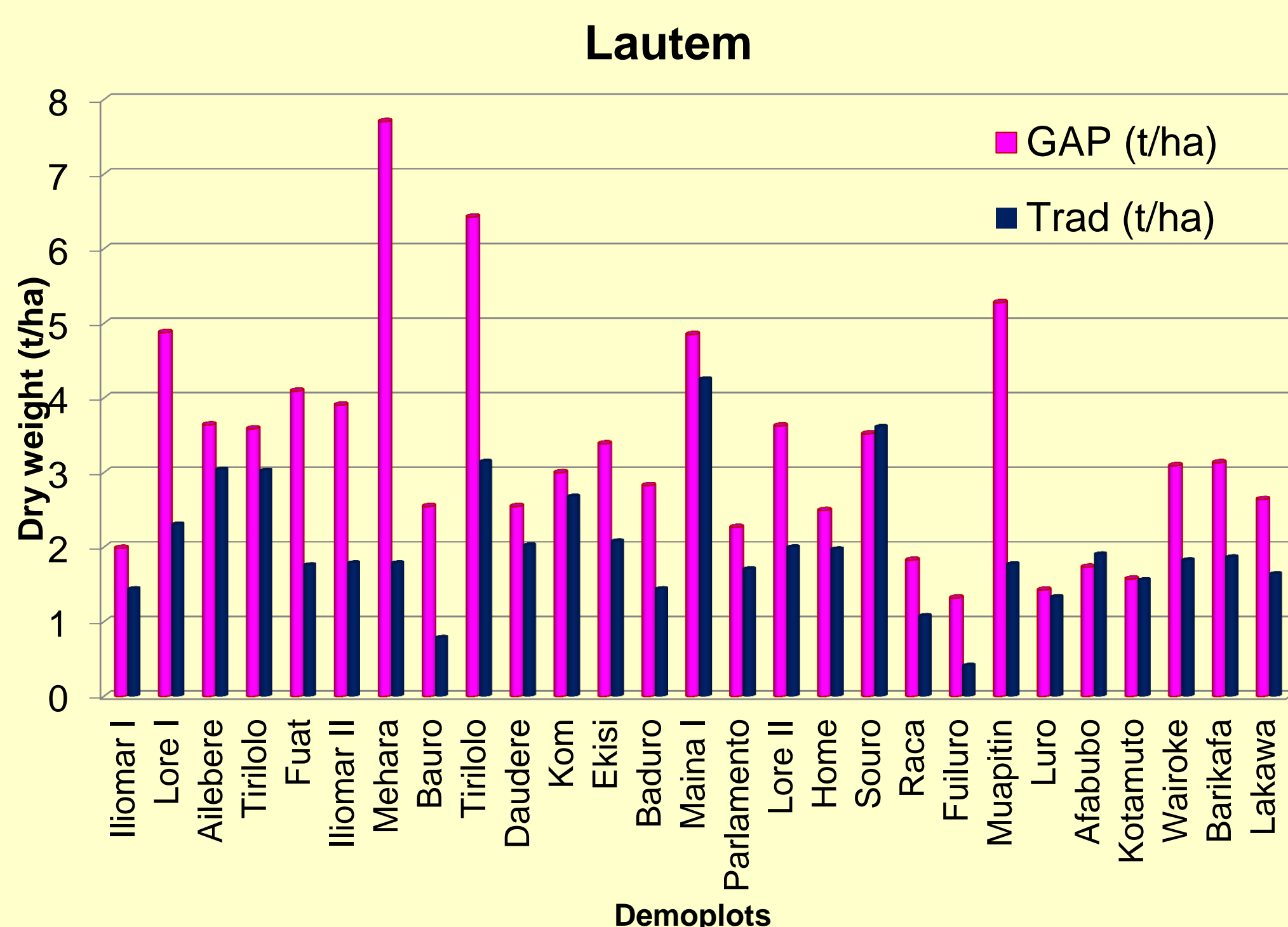
Results

The total of 210 demoplots planned only 205 were implemented. The data is showed in the table. The graphics representing different types of agro ecological

No.	District	GAP (t/ha)	Traditional (t/ha)	Increase (ton/ha)	Percentage (%)	Total Demoplots
1	Aileu	1.84	1.17	0.67	57	12
2	Ainaro	2.41	2.32	0.09	4	17
3	Baucau	2.53	1.48	1.05	71	42
4	Covalima	2.14	1.22	0.92	75	20
5	Lospalos	3.31	2.01	1.30	65	27
6	Maliana	2.50	1.57	0.93	59	22
7	Manatuto	1.98	1.4	0.58	41	10
8	Manufahi	3.19	1.64	1.55	95	20
9	Oe-cusse	2.72	1.66	1.06	64	10
10	Viqueque	1.83	1.01	0.82	81	25
	National Average	2.45	1.55	0.90	61.24	205



* Data husi DNAH; *Produsaun 2010 ne'e tamba impaktu husi mudansa klimatika



References:

- Desjardins, A.E., Susan A.M.C. 2008. Milho, makka, and yu mai: early journeys of Zea mays to Asia. Plants and Crops (United State Department of Agriculture, National Agricultural Library).
- Fox, J.J. 2003. Drawing from the past to prepare for the future: responding to the challenges of food security in East Timor. p. 104-144. In Agriculture: New directions for a new nation East Timor.
- Nabais, C. N., S. K. Kim, L. B. Fontes, A. Ferreira, and A. Jeronimo, 2014. "The Heterozygosity of Corn Variety of NAI Following Half-sib Selection Compared to one of its Parents". *Proceeding of the Understanding Timor Leste 2013 Conference*, Vol 2, Timor-Leste, pp. 126 - 130.
- Nabais, C. N., S. K. Kim, G. Rangel, M. Guterres, L. B. Fontes, A. Ferreira, and A. Jeronimo, 2014. "Corn Breeding for Downy Mildew Resistant in East Timor". *Proceeding of the Understanding Timor Leste 2013 Conference*, Vol 2, Timor-Leste, pp. 165 – 175.