

Abstract

The Highland Research and Development Institute (HRDI) has classified the agricultural areas on the highland according to the Physical characteristics. Biological and Agriculture livelihoods and divided into 5 areas, including The Opium-based Cultivation Community. The Forest Tea Cultivation Community. The Upland Rice and Maize Cultivation Community. The Upland Paddy-based Cultivation Community and Dry Zone This study uses area research principles can support the problem-solving and development agricultural systems suitable for agricultural ecology environment of highland community. The Upland Rice and Maize Cultivation Community research was implemented in Research Pongkam Highland Development Center, Tambon DuPong, Santisuk District, Nan Province. Mostly indigenous people has agriculture occupation in different areas and divided to 3 type (1) Paddy rice and maize in irrigated area (2) Fruit trees cultivation such as longan, lychee in foothill area. (3) Upland area need rainfall is 70 % in upland rice and maize cultivation of total area. Until the crop season in 2016, the price of maize was lowest in 10 years, with the price decreased from 7 baht per kilogram to 3.5-4.5 baht, and the volume of product is limited on a daily. The effect is income decrease and debt increase. So necessary to study alternative cropping systems that can generate short-term and long-term income instead of upland –paddy maize plant by the participation of Researcher and Developers in this area. And there are farmers pilot 5 villages, such as Pongkum, Sriboonruang, Na-Lao, TonPeung, and NumSong

The result of plants alternative technology for incomes were 1) Irrigation water field area consists with A) Japanese sweet potato testing that there were 2 strains, Beni Azuma (yellow flesh) and Ayamurasaki (purple flesh) for 10 persons own farm. The average of yield of purple flesh sweet potato was cultivated by top sprout are 1,485 Kg/ Rai, the average of weight are 296 g/plant, the number of average of tube are 2-3 tube/plant by average of weight are 125 g/tube and the average of sweetness are 10.88 brix. For yellow flesh sweet potato was compared the top sprout and second sprout cultivation showed that the average of yield of top sprout plant cultivation are 2,243 Kg/Rai, the average of weight are 448.61 g/plant, the number of average of tube are 4-5 tube/plant that more than the plant which was cultivated by second sprout. The average of yield of second sprout are 1,709 Kg/Rai, the average of weight are 341.97 g/plant and the number of average of tube are 2-3 tube/plant. On the other hand, the average of plant was cultivated by top sprout are 80.42 g/plant that lower than plant was cultivated by second sprout, the average are 99.18 g/tube. The average of sweetness of both treatments are 7.2 brix, furthermore 2 strains of Japanese sweet potato were compared with landrace strain by analysis of nutrient after

microwaved to steam. The result showed the yellow flesh Japanese sweet potato have highest of Dietary fiber and Starch are 8.36 and 47.31 g/100 g next the purple flesh sweet potato are 7.46 and 44.75 g/100 g, the lowest is landrace strain that are 5.54 and 27.67 g/100 g respectively. Phrasong Teanboon MD,Ph.D. had reported to Dietary fiber Helps to balance the digestive tract and is beneficial to people with diabetes. Glycogen and starch are the main sources of energy. When our body needs energy, it will be digested into glucose to metabolize for energy. It also analyzes Anthocyanin, a pigment or a substance that gives red purple and blue color, plants with high Anthocyanin can help cell degeneration slow down and reduce the risk of heart disease and stroke in the brain by inhibiting blood clotting. The deterioration of the eyes slow down. It is inhibits pathogenic Escherichia coli in the gastrointestinal cause of diarrhea and poisoning food. The result of analysis of Anthocyanin in purple flesh sweet potato (steam) are 1,054 mg/kg that higher than in Purple cabbage Radish and Red onion (Marcin et al. 2008).

(2) Upland rainfall area consists with (A) Cultivate testing of fruit tree's Royal Project and Commercial variety, there were 3 varieties of fruit. Mango Avocado and custard apple that had cultivated since 2014, all of them was good development and expected going to begin the product in 2018. For 2017, the fruit trees were cultivated with soil and water conservation systems, there are varieties of Avocado (Pinkerton, Peterson and Rootstock varieties), varieties of Mango such as Choke Anan, Num Dok-Mai Sritong, Kaew (root stock), Guava (Kim Ju), Thai plango, Long kong, Custard apple (Petch Pakchong varieties) and Sour Tamarind. In the plot of 12 farmers were found that after 1 month of planting, Fruit trees has shooting tip (B) Rattan (Nam-khao varieties) were planted for breed testing cooperated with 18 farmers and (C) The experiment was carried out on 4 farmers, comparison between the method of planting by the Royal Project which was planted in rows with 50x50 cm spacing and original method by farmers that was have no obvious spacing. 1 month later, the result was showed that both methods are growing well. The participation action research was enhanced the learning of farmers in many aspects. Farmers involved in the identification process of agricultural community issues, selecting of the problem in community, the farmers able to know the potential of localities of land owner. In addition to planting maize the farmers are aware to their own abilities by the cropping technology testing and alternative of plants species, the farmers able to together learning for breeding of original plant of community.

Keywords: Area Research, Agriculture Sustainable, Pongkam