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**5. Soil Security and Food Security**

**Oral Presentation**

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### **Improved Crop Production under Conditions of Drought and Seawater Intrusion by Integrated Rice-upland Crops Rotation and Soil Management**

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Climate change has increased the occurrence of drought and the extent of seawater intrusion onto agricultural land of the Vietnamese Mekong River Delta. These changes threaten the sustainability of rice production in the region, an area which produces 90% of the nation's rice exports.

In the regions lying along the coastal line, crops of lowland rice in the dry season often fail due to drought and salinity, so alternative options are in necessity for farmers to produce profitable crops. This project introduced a diversity of upland crops which are short duration, salt tolerant and use water efficiently to rotate with paddy rice. The field experiments were implemented in two sites in the province nearest to the sea. The main plots were the alternative crops (maize, beetroot, watermelon and soybean) distributed in a completely randomized block design. The sub-plots were soil applied with rice straw mulch at different rates (0, 4.5, 7.0 and 10 tons/ha) aiming to reduce soil water evaporation and thus, reducing effects of salinity. Over two consecutive years, the yields of beetroot and maize significantly increased with increasing mulching rates. With beetroot, the highest average yield (42 tons/ha) was recorded in the treatment with soil mulch at 10 tons/ha. Whereas, the control yielded the lowest 19 tons/ha. The highest yield of maize (5.4 tons/ha) was also occurred from soil with mulch at the highest rate. Soybean was not a suitable crop option as it was negatively affected by saline conditions. The effects of soil mulch on soil salinity were different with crops. Applying mulch significantly decreased soil EC<sub>1:5</sub> (dS m<sup>-1</sup>) at the surface 0-15 cm of soil in beetroot plots at the end of the growing season. On the other hand, the significant effects of mulch on soil EC under maize were recorded in the mid-point of the season.

Given the success of alternative crops to rice in the dry season, investigation of markets factors is being studies to help facilitate larger scale implementation of the outcomes of this project.