



## MICROBE TO FIGHT SOIL SALINITY

CCARI/Success Story/2022-1

### IMPROVED CROP ESTABLISHMENT WITH GOA BIO-1 (A BIO-FORMULATION FOR PLANT GROWTH PROMOTION) IN PADDY CULTIVATION UNDER SALT-AFFECTED SOILS OF COASTAL REGIONS FOR ENHANCED INCOME

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#### PROBLEMS/CONSTRAINTS

Under salt-affected soils of the coastal region, productivity levels of paddy are very low. Apart from salinity stress, low soil biological activity, imbalanced use of fertilizers and poor crop establishment also reduce farmers' income. The usual farmers' practice in this region is broadcasting of the germinated seeds. When paddy is broadcasted or transplanted by farmers, plant population is generally sub-optimal due to initial salinity stress. Further, farmers usually undertake a blanket application of fertilizers.

#### INTERVENTIONS

Considering these existing problems and practices, ICAR-Central Coastal Agricultural Research Institute, Old Goa developed Goa Bio-1, a talc base based halo-tolerant Plant growth-promoting rhizobacteria (PGPR) for coastal saline soils. Goa Bio-1 improves the soil biological activity, crop establishment and plant growth parameters; and helps in nutrient mineralization, alleviation of salinity stress leading to higher yield. The improved crop establishment method for paddy cultivation involves seed treatment with Goa Bio-1 (@ 40 g/kg seed) followed by three to five days of imbibition and broadcasting the germinated seeds along with application of 75% of the soil-test based fertilizer recommendation.



Challenging saline soil environment



Goa Bio 1: A talc based bioformulation

#### IMPACT

These improved practices for crop establishment and nutrient management were demonstrated under coastal saline soils as well as under normal soil conditions in an area of 29 hectares covering 35 farm families of Dulape village, Tiswadi, North Goa for two consecutive years. The annual net income from the farmers' practice was Rs. 32,862/ha whereas the improved practices yielded a net income of Rs. 45,275/ha, which amounted to an additional income Rs. 12,413/ha, 38% higher than the farmers' practice.

Improved crop establishment using Goa Bio-1 is eco-friendly, economically viable technology which is sustainable in the long term. The technology has a potential to generate additional net income of about Rs. 22 crores by covering 18,000 hectares of coastal saline soils in the state of Goa alone. These successful demonstrations would encourage farmers in coastal regions to adopt these improved practices for boosting productivity, enhancing income levels and improving their livelihood security.



Goa Bio 1, boosting paddy productivity under saline environment