

# **RIVERBANK STABILISATION IN SOUTHERN CHILE**

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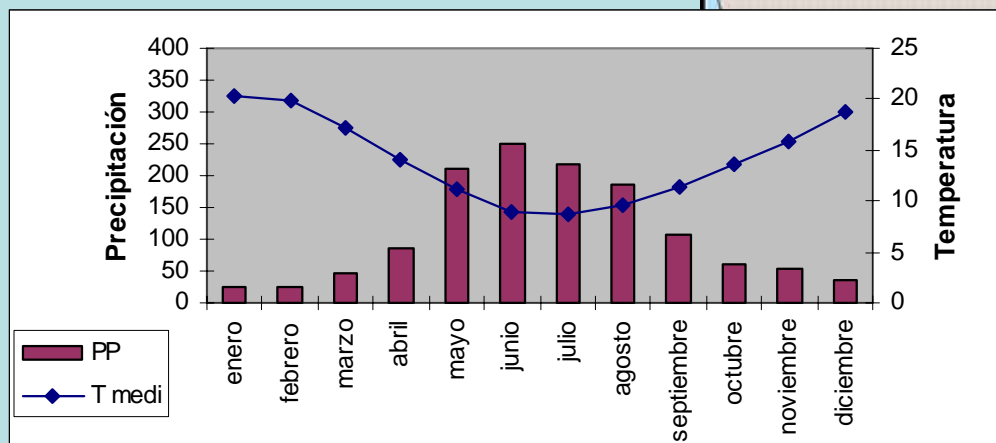
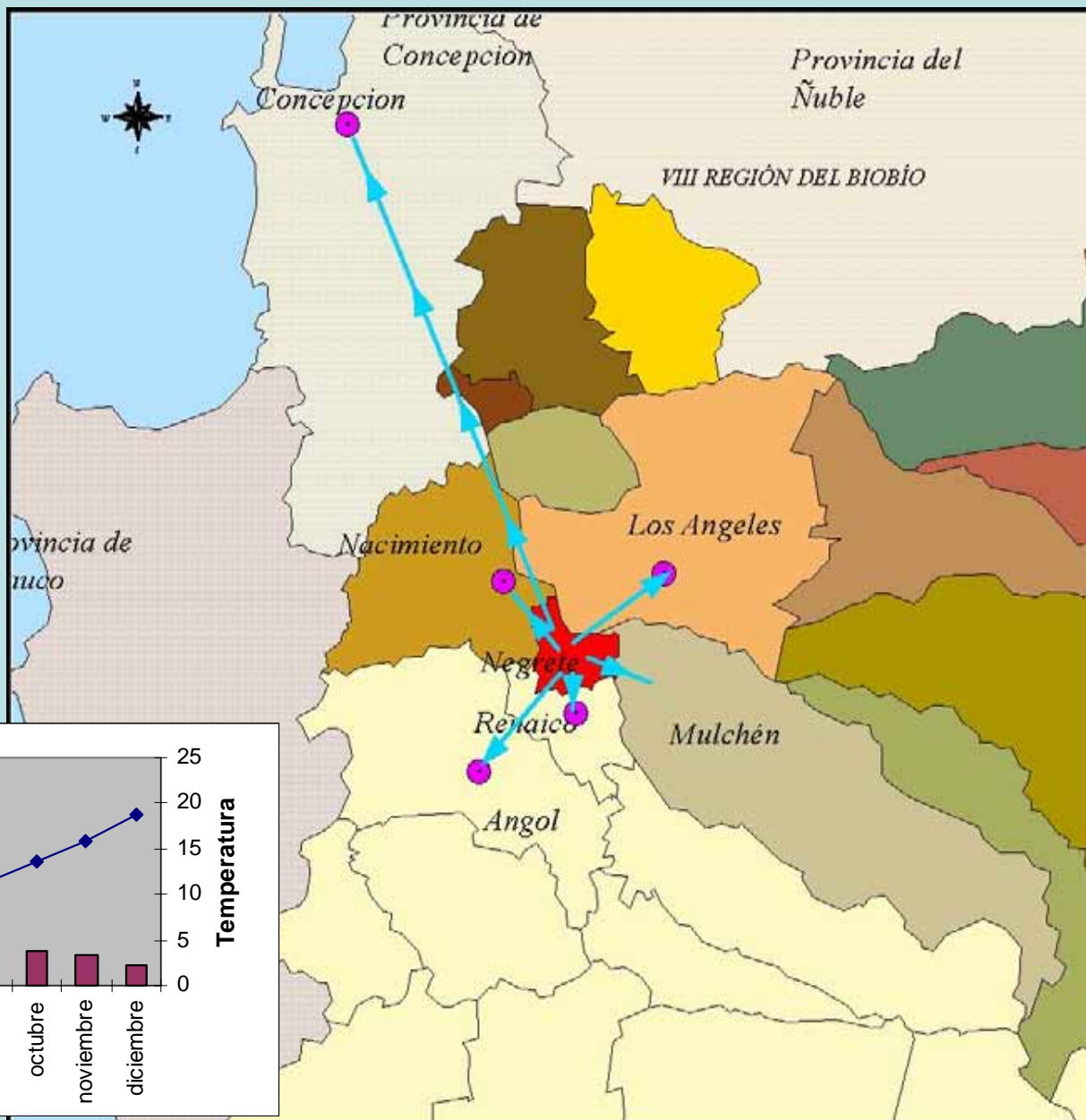
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# **Protection of the Main Irrigation Canal System Using Vetiver Grass Bio-engineering and Gabion Structure on the Bank of the Bío Bío River at Negrete, Southern Chile**

**This project was:**

- **proposed by the Bío Bío basin Irrigation Association at Negrete**
- **conducted by Bioingeniería Wallace y Cía, Ltda and**
- **funded by Ministry of Public Works of Chile and The Chilean Technological Innovation Fund**

The site is south east of Concepcion, approximately at latitude 38 south, with typical Mediterranean climate, cold and wet winter, with occasional frosts and hot, dry summer



**The Bio Bio River has seasonal flows, high flow and strong current with higher rainfall during winter, and in spring and early summer from the melting snow from the Andean mountains and drought during the autumn. Its width varies between 60-120m.**

**Its banks are very unstable and actively eroded, although most of its length is reasonably covered by native vegetation, they are ineffective during the high flow periods, resulting in sand islands forming along its course.**



## Rock basket and gabion are laid on the water edge



## Top soil fill on the main slope



**Slope gradient is about 1.5:1**







**Seven horizontal rows planted at VI between 0.8 and 1.0m**



**45 cross rows of 4m long and at 2m interval**



**Planted in mid summer, January 2007**



**A total of 7 200 plants were used, but due to shortage of potted plants, only 3 100 were polybags and 4 100 bare root slips**



## Fencing to keep livestock out



## Fertilizing and good watering is essential for early establishment



## One month after planting



## One month after planting





**One month after planting, good growth from polybags**



One month after planting, good growth from polybags but poor from bare root slips



**But after 18 months all plants are growing well**



**The gabion is under water**



**A small section was eroded during the first winter due partly to poor compaction and partly to the poorer growth of the bare root stock.  
This section was replanted last spring**



Very young bare  
root plants

**Except for a small cave in, the site has been successfully stabilised and its stability will be further improved when the plants mature.**

**From these results, it is recommended that:**

- **Only good quality plants (polybags) should be used for this application.**
- **Plant late in winter or early spring to reduce watering and providing longer growing time**

