

TOWARD A NEW SUSTAINABLE MANAGEMENT FOR MUSSEL CULTURE OPTIMIZATION

Mytilus galloprovincialis: A CASE STUDY IN THE IONIAN SEA (MEDITERRANEAN SEA, SOUTH ITALY).

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In recent years in many countries of European Union'(EU), mussel production has decreased, passing from 600,000 tonnes in the 1990s to around 430,000 tonnes in 2020. This lack of growth has been explained, by several environmental stressors, such as the lack of seed caused by predation by fishes, harmful algal blooms, climate changes and their consequences as heat waves. Besides this, structural causes include conflict in spatial use, fewer areas available for mussel culture and establishment of several illegal farms, with consequent high density of farmed mussels, high competition for space and food, with detrimental effect on mussels growth.



The aim of this work was to implement a new approach based on identify an optimal level of production that could reduce the workload of industry insiders obtaining a good quality of mussels and a profit maximization.



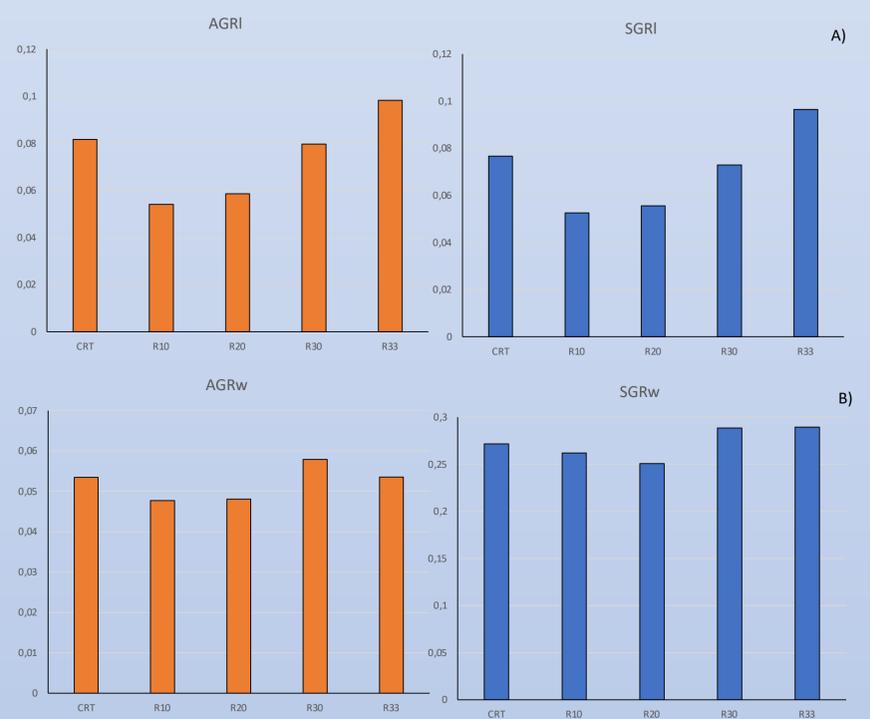
Experiments were performed from October 2022 to June 2023, in two commercial mussel farms located in the Second Inlet of the Mar Piccolo of Taranto (Italy). For each farm, 5 "chambers" were selected to house 4 experimental treatments plus a control one.

Mussel growth was compared among chambers with reduced number of collectors by 10%, 20% and 30% (18, 16 and 14, respectively) and chambers with 20 collectors but constituted by reducing the weight of mussels in the first grafting stage by 33%.



	L_{∞} (mm)	K (year ⁻¹)	t_0 (year)	ϕ'
CTR	61.00	0.38	0.67	3.15
R10	63.66	0.93	0.78	3.57
R20	66.09	1.39	0.70	3.78
R30	62.01	0.87	0.69	3.52
r33	62.34	0.84	0.49	3.51

Von Bertalanffy growth parameters (L_{∞} , K , t_0) of *M. galloprovincialis* and the index of growth performance (ϕ') evidenced a considerable difference in the growth. The results clearly indicated that experimental collectors were more suitable for the growth than those of the control (CTR).



The highest absolute growth rate (AGRI: 0.10 mm day⁻¹) and the specific growth rates (SGRI: 0.10) were observed in the mussels reared on collectors with r33 reduction. The absolute/specific growth rates determined on weight showed similar trend in all treatments with values slightly higher in r33 (AGRw and SGRw) and also in R30 (only in SGRw).



The percentage increase in weight of the collectors showed that starting from similar weight, the collectors belonging to the r33 reduction, exceeded the weight increase of the other treatments at the end of the experiment. Therefore, a lower quantity of seed used in the first grafting phase, determine a positive effect both on mussel growth and on labor.