Salt-tolerant plant could benefit aquaculture and agriculture

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Murdoch University researchers are leading a project to develop a salt-tolerant perennial crop capable of filtering fish farm waste water while providing feed for livestock.

Associate Professor Alan Lymbery from Murdoch's Fish Health Unit and Freshwater Fish Group said NyPa Forage – a commercial cultivar of the saltgrass Distichlis spicata – could offer solutions to a number of environmental issues.

"Dryland salinity is a major problem in Australia, affecting approximately 5.7 million hectares of agricultural land – a figure which is expected to rise to 17 million hectares by 2050," Professor Lymbery

said.

"The abundance of saline groundwater has prompted interest in growing fish on salt-affected farmland, but disposal of nutrient-enriched waste water is an issue, as runoff can cause problems such as groundwater contamination and algae blooms.

"As a potentially simple and cost effective solution, we looked for a salt-tolerant perennial with a large root system that could filter and trap effluent – one with the yield, protein level and digestibility to become a livestock feed.

"Having this secondary use makes an integrated aqua-agricultural system more economically feasible for farmers."

Professor Lymbery said tests showed NyPa Forage removed 60 to 90 per cent of total nitrogen loads and at least 85 per cent of ammonia, nitrite/nitrate, total phosphorous and ortho-phosphorus loads.

After fertilisation, crude protein levels and digestibility were roughly equal to grass hay and sufficient for maintenance or moderate liveweight gains in adult sheep or cattle – with no accumulation of toxic minerals.

Nutritive value was greatest when the plants were cropped at 21 or 42 days.

"What we need now is to expand these results to a full field study where we can run livestock on fertilised plants and make sure they feed at expected levels," Professor Lymbery said.

He said the project could contribute to the future-food challenge in years to come.

"Aquaculture is the world's fastest growing food production system and is expected to continue to increase in importance as the returns from wild fisheries decline," Professor Lymbery said.

"And as demand for coastal land rises, we may see integrated aqua-agricultural systems become more widespread and profitable."

A paper on the subject can be found here.

Provided by Murdoch University