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Mini Review

Agronomical Techniques and Methods for the Effective Production of Crop

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Abstract

Soil is a vital resource and its degradation poses challenges for modern agriculture, and its impact is expected to increase in the near future. The use of sustainable farming practices to restore and/or improve soil health. In addition, the expanding market for new functional/healthy natural foods is driving the search for potential alternative crop species containing promising levels of bioactive compounds. Wild edible plants are an important choice because they have been used in traditional gastronomy for centuries and their health benefits have been scientifically proven. It can grow naturally without human intervention. Into commercial farming systems. It is used but is valued for its high nutritional value due to its bioactive compounds, especially omega-3 fatty acids. It aims to present the effects of environmental stressors and the chemical composition of edible parts. Finally, we present information to optimize purslane cultivation and facilitate its management in degraded soils for use in existing agricultural systems.

Keywords: Purslane, Wild edible species, Stress tolerance, Nitrogen application, Organic amendment, Farming systems

INTRODUCTION

The world population is estimated to reach 10 billion by 2050. The demand for food production will increase significantly as the population grows and better nutrition becomes available to those who are currently food insecure. On the other hand, modern agriculture in recent decades has relied on intensive agricultural practices aimed at producing the high yields needed to meet current food demands. However, the increase in agricultural productivity needed to meet the necessary food needs may not be improved enough in the future **(Chandra AK, Kumar A., 2020)**

There are various environmental factors that are detrimental to agriculture. Increased temperature or decreased precipitation, as well as various types of soil degradation (salinity, nutrient deficiencies, degradation of organic carbon in the soil, or reduced water holding capacity). Thirty-three percent (33%) of the world's agricultural land has undergone some degree of degradation, and 25% is considered already degraded. Several important agricultural regions of the world, such as the Mediterranean Basin, Western Asia and North America, are even more sensitive to desiccation.

In order to improve and restore degraded farmland soil, the introduction of new varieties and crops that adapt to natural conditions and are easy to manage has been proposed **(Cole S A, Xiong W., 2017).** This is the case for wild edible plants (WEP). Wild edible plants (WEPs) can grow under natural conditions without human intervention and are traditionally used as a food source or as a complementary ingredient in local recipes, or even as 'hunger food'. The native or naturalized plant species used. The availability of WEP varies by region and growing conditions, but his cultivation of WEP, adapted to water scarcity, high salinity and high summer temperatures, is the most interesting feature for the conditions of the Mediterranean Basin **(Mason N M, Jayne TS., 2017).** The successful integration of WEP into cultivation systems, thanks to its ease and hassle-free cultivation, not only enables farmers to diversify

their crops under harsh environmental conditions, but also implements sustainable agricultural practices. , can also restore and improve soil quality. In addition to agronomic aspects, the nutritional value of WEPS should also be taken into account. In recent decades, changes in human diet and health care, such as excessive calorie and meat consumption, and reduced physical activity, have increased the incidence of chronic diseases **(Luo Y, Long X., 2017).** This has led to an increase in public interest in healthy eating and a new market trend for nutritious and organoleptic health foods such as those offered by WEP **(Wang h., 2017).** The current dynamic can therefore provide new opportunities to create new healthy foods for both small and large food industries, and small farms and rural communities can also benefit from these trends.

It is a succulent plant of the Purslane family and a succulent plant. Purslane can complete its life cycle in two to four months and has the ability to reroot after being chopped, provided the stem remains moist. Purslane is also known for its tolerance to stressors, as it is considered a halophyte that can survive in moderate salinity conditions **(Baleženti T, Blancard S., 2021).** Additionally, it has C4 metabolism and under stress he can switch to a CAM-like metabolism. This property makes water use more efficient, making purslane a very competitive alternative in arid regions with water scarcity and high temperature conditions. It is considered a wild edible plant with a worldwide distribution and is one of the three most commonly reported weeds in the world. It grows easily in warm, dry places and is widely distributed in the Mediterranean, Asia, Caribbean, North America, Mexico and Australia. Though considered a noxious weed affecting conventional crops in many parts of the world, it has also been traditionally consumed in Spain, Greece, Italy, Turkey, the United States, China, etc **(Balsalobre-Lorente D., 2019)**. Valuable parts of purslane are fresh leaves and stems with a characteristic sour taste. It is mainly used in fresh green salads, but can also be pickled and boiled. However, purslane has received particular attention in recent years due to its exceptional nutritional content, primarily its high content of omega-3 fatty acids (Barbera AJ, McConnell VD., 1990). Antioxidant compounds such as vitamins A, C, E and B; minerals such as potassium, calcium and magnesium, especially when plants are grown under conditions of stress where high concentrations of beneficial compounds are found. Some consider purslane to be the "food of the future," related to the species' pharmacological properties, including its antioxidant, anti-inflammatory, anti-diabetic, anti-obesity, and liver-protective potential.

MATERIALS AND METHODS

Data collected from Scopus, PubAg, Agris, PubMed, and Science Direct databases over the period 2007–2022 were reviewed and analyzed using smart tools and Boolean (AND, OR, NOT) and proximity operators. Rice field the central axis descriptor was 'portulaca oleracea' or 'purslane' using the 'article title' search field **(Adetutu MO, Ajayi V., 2020).** A total of 135 articles were found as a result of searching for keywords or cowords on purslane cultivation using the search file 'Article titles, abstracts, keywords'. The searched keywords or colloquial terms are: "Fertilization" (12 items), "Nitrogen fertilization" (8 items), "Germination" (50 items), "Mud liquid" (5 items), "Arbuscular mycorrhiza" (2 items), "Harvest AND stage" (11 items), 'Cover crop' (1 item), 'Drought' (38 items), 'Salinity' (65 items), 'Heat' (28 items). We selected articles that studied the growth and yield of purslane, the reproduction and nutritional characteristics of the species. The presented results relate only to purslane **(Z Meng J., 2017).**

FUTURE PROSPECTS AND CONCLUSIONARY REMARKS

Soil degradation, water scarcity and rising temperatures are the main problems of conventional agriculture. The introduction of new/alternative species into existing agricultural systems is critical for agroecosystem sustainability and rural area development. In addition to the primary industry, the food industry can also benefit from increasing the value of such seeds through the development of functional and healthy food products, and by adopting a circular economy approach; plant by-products and processing departments can deliver new antioxidant compounds. Presented a plan to introduce purslane as a new functional crop.

In recent years, several new compounds with potential bioactivity have been isolated from Purslane, indicating the high antioxidant capacity of the species. For example, while various studies have identified new alkaloids with anti-inflammatory activity, two new lignans with similar properties have been discovered. Isolating these novel compounds and incorporating them into the development of new formulations, nutraceuticals and pharmaceuticals can increase the added value of purslane. In addition, we propose that the value of purslane seeds as a raw material for biodiesel production and feedstock will increase, and that seeds, seed oils, and processing by-products (seed cakes) are likely to be used as new sources of omega-3 fatty acids reported food industry. All these aspects highlight the multiple perspectives of purslane, especially in small farms on the Mediterranean coast, where it can produce high value-added products and secure income for farmers.

In conclusion, the need to replace conventional crops in areas where cultivation is unprofitable in the short and long term with new alternative species that can adapt to climatic conditions is of great importance. Edible plants in the wild are potential candidates for new crops. Stressors such as heat drought, salinity, or soil degradation. The information presented is therefore useful to farmers and can be used as a best practice guide for achieving the highest yields and highest quality end products. Development of a best

practice guide for updating stress resilience is required. New sustainable practices in purslane cultivation, such as compost application, biostimulants or biofertilizers, to determine impact on purslane biomass yield and/or nutrient quality for land reclamation and restoration of degraded soils should be further evaluated in order.

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