

P45 INTERCROPPING – MAY BE AN OLD PRACTICE BUT TIMELESS: A SHORT REVIEW

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Abstract

Intercropping is known as the achievement of a high and stable production that not only raises complementary products in the area but also reduces the harmful effects of diseases and pests, prevents pollution and results in effective use of resources. Intercropping is an agricultural practice of cultivating two or more crops in the same place of land at the same time which is commonly practiced in many parts of the world in order to increase the productivity per unit area of the land. There are several intercropping systems such as mixed, strip and row intercropping patterns. Also, intercropping can be a method of improving diversity in agricultural ecosystem.

Introduction

Intercropping has a very old history and it is define it as the agricultural practice of cultivating two or more plant species in the same area at the same time. Sowing time and harvest time may not be the same but most of the times are time-matched. By cultivating more than one crop at a time in the same field, farmers maximize the efficiency of water use, maintain soil fertility and minimize soil erosion, which are serious disadvantages of monoculture (Ghanbari and Lee, 2003; FAO, 1983). Several scientific studies have been carried out on cereals and legumes interconnection systems and prove their success compared to monocultures. Some studies have shown that intercropping culture was more productive than the monoculture due to the complementary effect of the intercrops of such studies included, cucumber-cowpea, amaranth-cowpea (Bhatti *et al.*, 2013) cowpea-corn and cowpea mushrooms (Gomez and Gomez, 1983). As a result of the rapid population growth, the demand for food production is increasing, but unfortunately the availability of cultivated land remains the same or decreases. Thus, the only way to increase agricultural output is to increase yields per year (Odedina *et al.*, 2014).

Types of Intercropping

Cultivations can be grown together in a variety of ways:

- **Mixed** intercropping is the practice in which two or more species simultaneously develop in a field without the use of any particular spatial configuration.
- **Strip** intercropping is the practice of cultivating two or more crops in separate but adjacent rows at the same time close enough to each other to interact.
- **Relay** intercropping comprises the step-by-step planting of two or more cultivations together so as to overlap only parts of their life cycles.

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Mechanisms

Complementarity is a general term describing the positive effects that can result from intercropping. There are two mechanisms that contribute to complementarity:

- Resource allocation, also known as segregation and position differentiation, describes the fullest use of available resources from combining crops compared grown separately. The choice of plants for the method of mating depends on the depth of rooting, phenology and plant architecture between the cultivated species at a junction can minimize competition and increase resource allocation.
- The facility refers to processes whereby one type of crop provides a limiting resource or improves the environmental status of another crop. A classic example is the supply of nitrogen from legumes to the soil.



Picture 1. Intercropping chili with corn (Ouyang *et al.* 2017)

Advantages of Intercropping

Intercropping is used to gain the most benefits. The advantage of intercropping is that increases productivity by reducing external inputs. It has a low cost that's why is very useful for low income farmers (Eskandari, 2012). There are many reports on the positive results and the superiority of intercropping than the monoculture. The most important advantages of intercropping are :

- Increased crop production: Intercropping has been shown to reduce the risk of crop failure by increasing crop yield stability over time and in all locations (Bybee *et al.*, 2016; Raseduzzaman and Jensen, 2017).
- Better resource management: Increased crop production often seen at intercropping compared to unique crops was the results of the full exploitation of natural resources such as solar energy, soil nutrients and water (Szumigalski and Van-Acker, 2008).
- Reduction of pest diseases: Residual trapping of parasites or pathogens to prevent damage to the main species.
- The benefits of weed control over pure cultivation are two ways. First there may be weed suppression or may provide yield advantages without suppressing weed growth below the levels observed in net harvesting of components, if intersections use resources that are not exploitable by the weed (Haugaard *et al.* 2003).

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