

I. WHY INTERCROPPING

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In recent years, two sets of definitions have been given for the various cropping patterns involving the planting of two or more crops in various combinations and sequences in the same plot of land (Papendick et al., 1976; Nelliath and Iyer, 1977). In this note, 'intercropping' is being used in the broadest sense to include all these cropping patterns.

In recent years, there has been considerable interest in intercropping because of the imperative need to increase production and productivity from a unit area of land consequent upon the increasing demands for food, clothing and shelter for the increasing *population because of the increasing difficulty* to get more areas under the plough. Though, it could then appear that intercropping is of recent origin, a general survey of the agricultural systems and agricultural origins would indicate that intercropping was the first agricultural system to be practised since the beginning of agriculture.

A study of agricultural origins show that the early man took to farming when it became increasingly difficult for him to obtain all his requirements for food, shelter and clothing by just gathering them from the nature. He then forsook his itinerant habits and took first to protecting plants which yield him food, fuel and his other needs and when this no longer met his requirements, to cultivating them in his backyard, possibly in homesteads established near a source of water. Thus, the early man would have

planted a number of species of plants required to meet his needs of food, fuel, clothing, medicines, poisons of plant origin to meet his hunting habits, and so on. Gradually, as his needs for the number of items and the quantity of each item increased, he would have experienced increasing difficulty to grow all his requirements. Thus, farming steadily became an increasingly specialized job, and as a consequence, different farmers took to the cultivation of different crops in pure stands. Gradually, the cultivation of crops in pure stands was developed to high levels of perfection and productivity, especially with the mechanisation of agriculture. *Even then, in much of Asia and Africa, particularly in the tropics and subtropics, farmers have been generally practising intercropping to various degrees and extents. While this is less evident in situations receiving high rainfall and control of water is difficult, intercropping is the standard farming system practised by all the farmers in their homesteads. Particularly in the tropics, it is a common sight to see mixed stands of annual and perennial crops, erect and twining plants, comprising of even 20-50 species, in a homestead of 0.5-1.0 ha area.*

However, since the last two or three decades particularly agronomists and plant physiologists have been trying to develop ideal compatible combinations of crops consisting of 3-5 species with a view to maximising productivity in this farming system. As a consequence, considerable

work is underway today all over the world to study the mechanics of productivity of the various cropping patterns and also to develop ideal cropping combinations or sequences of crops which could maximise the production and productivity. These are achieved in a variety of ways by maximising 'the harvesting of the sun', by ensuring optimal canopy development of different crops, by growing crops having different kinds of rooting systems so that each crop could draw nutrition from different depths of the soil, by growing together crops which show symbiotic relationships with each other, by growing mixtures that take into account the varying levels of water in a field according to the progress of the monsoon (specifically, when mixtures of rice varieties are sown and transplanted), and also by preventing an undue development of pests, diseases, and weeds by either restricting the availability of food supply to them, or by ensuring their natural biological control.

The growing of annual crops in mixtures and sequences have made it possible to increase the cropping density from 1.0 up to about 4.0 under the most optimal conditions, in situations where sunlight, nutrients, and moisture are not limiting factors and where the application of these inputs can be regulated. However, this kind of a modelling will be difficult in intercropping systems involving combinations of perennial crops, and perennial and annual crops in various

combinations. Also, often in such systems, not every component of the cropping system is used, primarily for food purposes and also that more than one part of the same plant would be utilised and for widely different purposes. The coconut is a good example, in which the nut is used as a source of oil or as a food, the husk is used for extracting fibre or as a fuel, the leaves for thatching purposes or as a fuel, and the stem again for building purposes or as a fuel. Should we then give a score of 1.00 only when a pure crop of coconut is raised? In a mixed cropping system involving coconut, cacao, black pepper, and pineapple, the cacao and black pepper are used as flavour, and pineapple as a food.

It is only since the last 3-4 decades, that the various beneficial effects of cropping systems involving the growing of annual and perennial crops in mixtures or in rotations have been increasingly appreciated. Today, as has been stated already, intercropping systems are considered as one of the most productive and profitable ways of cropping.

REFERENCES

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