INTER CROPPING SYSTEM IN TAMIL NADU

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Inter Cropping:

Meaning:
Intercropping is the practice of growing two or more crops in proximity. The most common goal of intercropping is to produce a greater yield on a given piece of land by making use of resources that would otherwise not be utilized by a single crop. Careful planning is required, taking into account the soil, climate, crops, and varieties. It is particularly important not to have crops competing with each other for physical space, nutrients, water, or sunlight. Examples of intercropping strategies are planting a deep-rooted crop with a shallow-rooted crop, or planting a tall crop with a shorter crop that requires partial shade. Inga alley cropping has been proposed as an alternative to the ecological destruction of slash-and-burn farming. Growing of two or more crops simultaneously on the same piece of land with a definite row pattern e.g. growing set aria + red gram in 5:1 ratio i.e. after every 5 rows of set aria one row of red gram is sown. Thus, cropping intensity in space dimension is achieved. Multiple cropping in the form of intercropping is predominant in the regions of dry, humid and semi-arid tropics.

The objectives of Intercropping Systems are:
1. Insurance against total crop failure under aberrant weather conditions or pest epidemics.
2. Increase in total productivity per unit land area.
3. Judicious utilization of resources such as land labour and inputs.

At present the main objective of intercropping is higher productivity per unit area in addition to stability in production. Intercropping systems utilizes resources sufficiently and their productivity is increased. When Intercropping was originally practiced as an insurance against crop failure under rainfall conditions two crops are to be grown together, they are chosen in such away that there is variation in their growth duration. The peak periods of growth of the two crops species should not coincide. In such arrangements, a quick maturing crop completes its life cycle before the other crop starts. Willey (1979) described the concept as temporal complementary. Greater differences in maturity and growth demands of the crop components, more opportunity is provided for greater exploitation of growth factors and over yielding. This will be achieved either by generic difference in crop species or manipulation of planting dates. Normally short and long duration crops are grown together. Based on the per cent of plat population used for each crop in intercropping system, It is divided in to two viz; additive series and replacement series.

For successful intercropping, there are certain important requirements:
1. The time of peak nutrient demands of component crops should not overlap in maize – green gram intercropping system, the peak nutrient demand period for green gram is around 35 days while it is 50
days for maize.
2. Competition for light should be minimum among the component crops.
3. Complementary should exist between the component crops.
4. The differences in maturity of component crops should be at least 30 days.

**Merits of multiple cropping systems:**
(1) Dependence on only crop is avoided.
(2) Less need to import energy.
(3) Reduction in the outlay for fertilizers.
(4) There is much greater flexibility of the distribution of labour.
(5) Possible to recover investments in much less time.
(6) Availability of harvest over a much longer period of time.
(7) Can occupy much more labour.
(8) The farmer of little economic resources can produce a large variety of useful products.

**Disadvantages of multiple cropping systems:**
(1) Competition between plants for light.
(2) Competition between plants for soil nutrients.
(3) Competition between plants for water.
(4) Possibility for allelopathic influences.
(5) Harvesting of one crop component may cause damage to the others.
(6) Difficult to incorporate a fallow period.
(7) Many times very difficult to mechanize multiple cropping systems.
(8) Increase in evaportranspiration loss of water.
(9) Possible over-extraction of nutrients.
(10) Higher relative humidity in the air can favor diseases.

When we observe that most natural plant communities consists of a mosaic of individuals of many species, we are perhaps struck by the relative simplicity of crop communities in "advanced" countries. Apart from the generally small populations of weeds, the plants of a present-day crop field have very similar and often identical genetic constitutions. Man has not always grown his food in such a way though. In neolithic times, the first crops were mixtures of cereals with a wide range of weeds. Selection practiced through thousands of generations, seed cleaning, and the development of cultural methods against weeds reduced the heterogeneity of these early crops. During recent years plant breeders have aimed to produce genetic uniformity within crop varieties, and the use of selective herbicides has simplified the weed flora. To make mechanization more profitable, farms have been amalgamated and hedges and fences have been removed; consequently, individual genetic differences which originally existed between varieties grown in various localities, regions and continents are disappearing as the multitude of locally adapted varieties are replaced by a relatively mall number of widely-adapted, higher-yielding types.

**Crop mixtures and the future**
This article has shown that in a series of cases mixed cropping has biological advantages over the use of pure cultures; multilines may also have advantages. However, in real life, it usually is not biological but
economic advantage which decides what farming and cropping systems are actually used. Since mixed cropping often involves staggered plantings and selective harvesting it tends to be labour intensive. If it is soundly practiced, it may require less pesticide, weedkiller and fertilizer, and so be a lowpolluting method of farming. Where there is rural unemployment, where capital is in short supply and where production must be sustainable without expensive fossil fuels and pollution control, mixed cropping is a possible solution. Thus in Nigeria and Malaysia, rubber planters are being advised to interplant their rubber with cash crops to raise capital for replacing old stands. The jobs so created can help to slow or reverse the drift to the towns.

It has been emphasized already that for mixed cropping to be biologically advantageous, the mixture components need to be chosen with care. Unfortunately, the interactions among the plants, animals and microorganisms in a crop are so subtle and specific to particular locations that present knowledge only provides a rough guide as to what new combinations of crops and varieties should be tried. If then the possible advantages of mixed cropping are to be exploited, local experimentation will be needed, using a range of possible components and a series of seasons. In the search for "ecological combining ability", the traditional combinations should perhaps be evaluated first, as at the International Rice Research Institute in the Philippines. Better, more compatible components for mixtures are being actively sought in many research centres. Examples where ranges of types are under test include trials of shade trees for cocoa (Sarawak) and for tea (India), of intercrops for rubber (Malaysia), of grasses for hay mixtures, (UK, USA, USSR) and even of strains of nitrogen-fixing bacteria for introduction into the legume component of grass-legume mixtures (Australia). If the difficulties of managing diversity in the crop field can be overcome, diversity in this and other forms will help to safeguard our crops against pests and epidemic disease. Unless the Green Revolution changes course, much of the world's green could turn to rust-red almost overnight.

**CONCLUSION:**

Long duration crops like pigeonpea, castor and cotton are deep rooted and leave a lot of root burrows. They allow the recharging of root profile when it rains during off-season and are likely to improve the soil physical conditions and water holding capacity, thereby creating a congenial environment for the succeeding crop. Such positive interactions need further intensive research. Careful selection of the crops is vital for mutual benefits in the system particularly for the optimum use of the given resources both spatially and temporally.

In order to attain desired populations of each crop, the existing implements seed drills with the farmers evolving suitable implements for the recommended geometry, simple planting patterns and / or custom hiring service must receive due consideration. This will go a long way in boosting the area under ICS besides covering large area in shorter period of moisture availability in rainfed areas. Paired row or strip cropping preferably in additive series deserves more attention.