

# MULTIPLE CROPPING: THE CHINESE EXPERIENCE

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## INTRODUCTION

In June and July of 1979, representatives from thirteen countries, including two from Papua New Guinea, went to China to take part in a study tour.

The tour was organised by the Food and Agriculture Organisation of the United Nations, and the Government of China. It was financed by the United Nations Development Programme (UNDP).

The aim of the study tour was to demonstrate methods of crop production in China and to help the representatives to find out ways of using these methods in their own countries.

## MULTIPLE CROPPING IN CHINA

China is a big country with a total land area of 973 million hectares. However, a lot of this land is too mountainous or too dry for cropping. This means that it is especially important that the good agricultural land is made as productive as possible.

Between 1949 and 1979, the population of China grew from 500 million to 960 million. Because of the limited amount of land available for agriculture, improvements in crop varieties and in cropping methods were needed to raise food production high enough to

feed all the people.

Varieties and techniques were therefore developed to allow more than one crop to be produced from each piece of land each year. This is called multiple cropping. For this system to work well, careful attention must be paid to water control, plant breeding, pest control and good agricultural practices such as fertilisation and soil conservation. These all help to increase the productivity of the land.

## TYPES OF MULTIPLE CROPPING

There are many different types of multiple cropping. Some examples are given below.

1) Double cropping. Here a second crop is sown as soon as the first one is harvested so that two crops are grown each year. An example of double cropping is following a winter crop such as wheat, barley, oil seed rape or beans with a summer crop such as rice, tobacco or cotton.

2) Triple-cropping. This method gives three crops per year. It is widely used in central and southern China where the growing season is long. Here the winter crop of wheat or barley is followed by two crops of rice, one after the other.



3) Intercropping. This is where several crops are grown on the same ground at the same time. The crops must be chosen carefully so that they do not interfere too much with each other's growth. For example a tall crop can be grown with a short crop so that each has plenty of space to grow in; a shallow rooted crop which takes its nutrients and water from the top layer of soil can be grown with a deep rooted crop which takes these things from lower down, and crops which mature at different times can be grown together because their times of greatest need for large quantities of nutrients will be different.

Multiple cropping is only possible when there are high yielding, quick maturing varieties and where plenty of fertilisers are used. It can only be carried out where the climate, the land form and the soil structure are suitable. Single cropping is still carried out in parts of China where the conditions are not

good enough for multiple cropping.

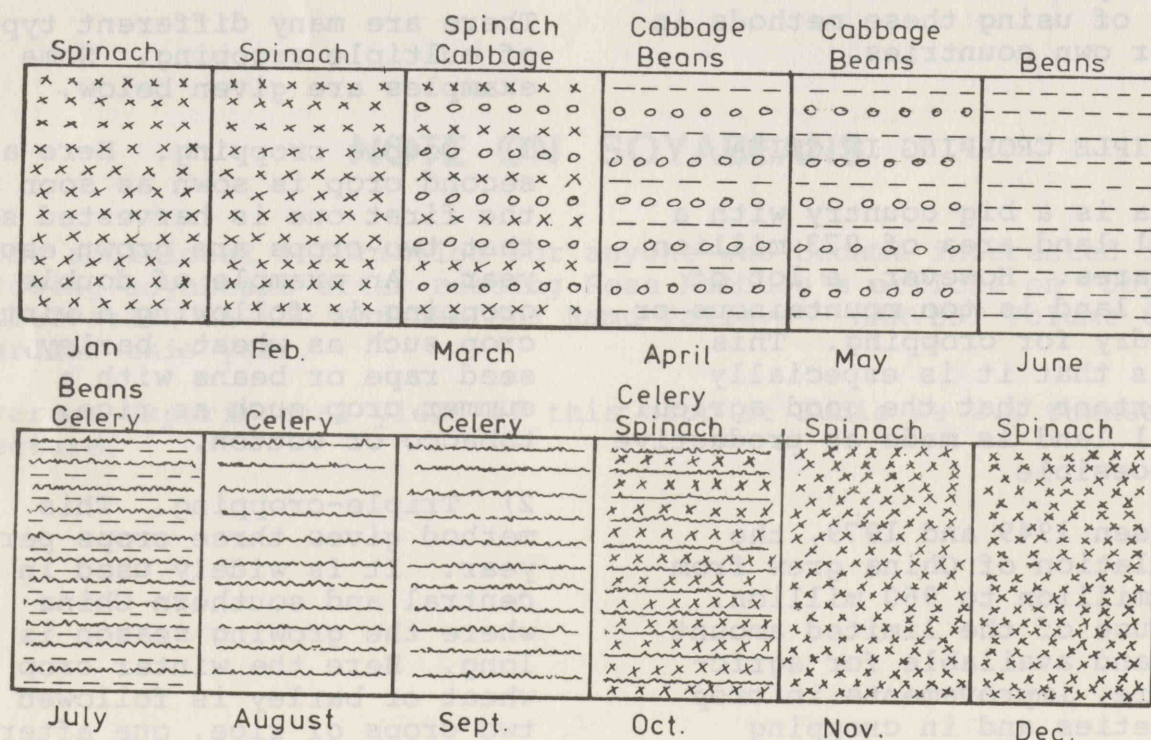
# EXAMPLES OF MULTIPLE CROPPING

The author's group visited two communes (settlements) during the study tour. Both of these were close to highly populated urban areas and provide examples of the type of multiple cropping carried out near to towns. In other areas, different systems are used.

## 1) Hsinanchun People's Commune

Vegetables grown in this commune include spinach, tomato, Chinese kale, celery, cucumber, Chinese cabbage, leek, raddish and gourd. Six different types of cropping system are used.

In one of these systems, spinach, cabbage, beans and celery are grown on the same plot. Spinach is sown in September and harvested in March. Cabbage is transplanted from the nursery in March and harvested in May. French beans



Garden plan for Hsinanchun People's Commune



are sown in April and harvested in July, and celery is sown in June and harvested in October.

The diagram on the previous page shows how the plot could have been laid out at different times of the year.

2) Long March People's Commune

Here two cropping systems were observed. Five crops were grown in the first system and six crops were grown in the second. The first system is described as an example.

Potato was planted in mid-February and harvested in early June with green vegetables being grown throughout this time between the rows of potatoes. String beans were sown immediately after the potato harvest and Chinese cabbage was sown after the green vegetables were harvested. The beans and Chinese cabbage were harvested by late August when spinach was sown for harvest early the following year.

The diagram below shows how this plot would have looked at different times of the year.

## APPLICATION TO OTHER COUNTRIES

Many developing countries realise that multiple cropping is a good way of increasing incomes from farms or gardens and of achieving self-suffic-

iciency in food production.

Multiple cropping is already being practised in some of these countries but it has not been as successful as in China. This may be due to differences in social systems, resource availability and national needs.

Some of the things which would have to be done before multiple cropping could be successful in a country are listed below.

1) Precise methods of water control, adequate fertiliser, soil improvement techniques and suitable crop varieties would have to be made available.

2) Effective extension services supplying leadership, follow-up support and anticipation of problems would have to be set up.

3) Precision timing techniques for crop growth, such as long nursery periods, use of hot-house nurseries, and use of varieties with different growth rates would have to be adopted.

4) A suitable amount of farm mechanisation, such as use of tractors, would have to be introduced.

5) Continuous improvement of soil conditions through organic recycling, green manuring, crop rotation and proper irrigation and drainage would have to be undertaken.

Spinach	Green Veg. Potato	Green Veg. Beans	Beans Cabbage	Spinach
Jan.	Feb. - May	June	July - Aug.	Sept - Dec.

Garden plan for Long March People's Commune

6) Research and extension effort would have to be aimed at constant improvement of techniques and solution of cropping problems.

#### MULTIPLE CROPPING FOR P.N.G.?

Multiple cropping could have many advantages for Papua New Guinea. The system would be especially useful in helping the country to achieve its aim of self-sufficiency in food production. It could also increase opportunities for agricultural employment, result in better care being taken of our soils and improve reliability of food supplies to rural and urban centres.

However, although some of the principles outlined in the section above have been adopted in this country, they have not yet been applied consistently or on a large scale. This would be necessary for maximum use of this method.

Present knowledge of annual crops suitable for this country would also have to be expanded upon and research to discover suitable crop combinations would be necessary.

This is perhaps one direction which the Department of Primary Industry could take in the future as it works to discover better methods of crop production for Papua New Guinea.