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Economics and Management of Vegetable Production

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PROCEEDINGS OF A SHORT COURSE ON ECONOMICS AND MANAGEMENT OF VEGETABLE GROWING

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PREFACE

The Vegetable and Produce Growers Federation for a number of years has been encouraging collection of costs of production of process crops. While this is valuable in maintaining a watching brief on processor pay-outs, it is only one factor in assessing the relative profitability of competing crops. The full science or art, of management must be brought to bear on the problems before any solution can be suggested.

With farmers diversifying into vegetable production and others likely to follow as processing expands into export it is opportune that a course such as this was held at this time. Some of the discussions show the pertinence of papers to problems facing the industry right now. Others show the way to the future.

The course offered a new look in education to vegetable growers. We have maintained that our greatest contribution to the established grower is to bring recent information to his notice - preferably after he has been in the industry for some time. With a recession in fresh vegetable prices, "economic" management is probably the most serious omission from growers' education. Fortunately in this department and others in the College we can present an expertise in this modern subject.

The papers do not attempt to answer all specific questions but are designed to give a base on which the individual grower can build for himself from his own experience. They also may serve to demonstrate to the grower that in horticulture we have a long way to go to fill the gaps in our "management" knowledge. It behoves all growers to help us and consequently themselves to acquire this knowledge.

Finally I must thank all lecturers at this course for they provided a stimulating four days and all growers who attended, for without a receptive audience no course can succeed.

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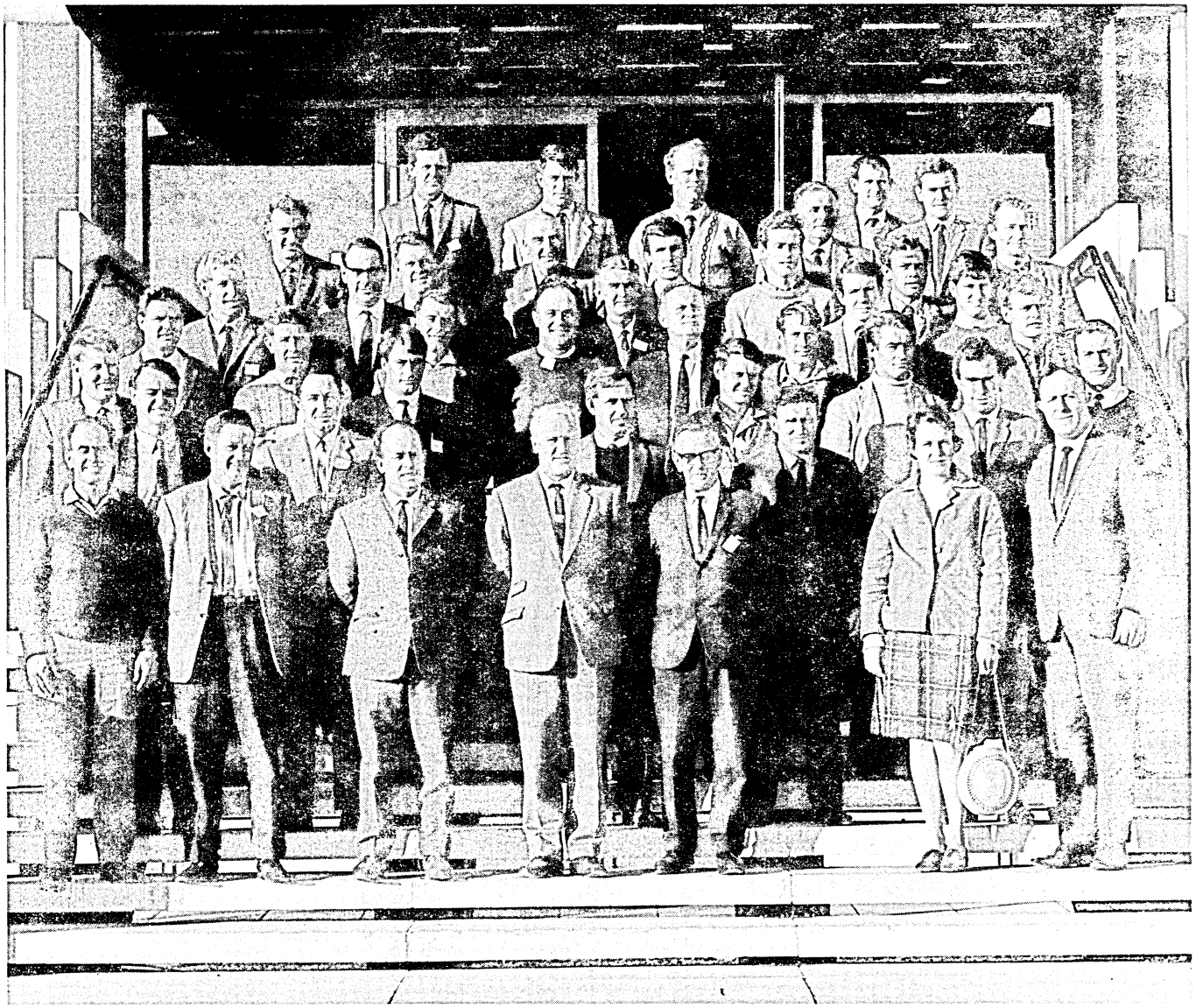

SOIL STRUCTURE PROBLEMS

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During this next 30 minutes I have to deliver an address related to the soil and in particular the maintenance of health of the soil.

It is of course an old subject which in the flow of scientific knowledge tends to get forgotton or pushed aside as it has been for generations. New Zealand has ample evidence of this with its scarred hillsides, evidence of the poor understanding man has for his environment. All over the world man has left a trail of havoc due to a lack of understanding of soil management. Today we still find that growers have a poor understanding of what soil is. Soil is not - "just to keep the plant upright" - as I was once told by an enlightened grower keen on the use of a new chemical wonder fertiliser, it is a living medium which must be nurtured very carefully if it is to give of its best.

Two factors are of importance when considering soil. They are (1) structure and (2) pest and disease incidence. The structure of the soil determines the degree to which the basic constituents of the soil i.e. sands, clays, silts and organics (texture of soil) are bound together into particles or crumbs.

A soil that has a good structure is one in which there are ample air spaces between the particles for air and water to be held. Under such conditions the soil acts as a sponge during rain and absorbs and holds water while gas exchange between roots, the soil and the atmosphere is uninhibited. Such a soil stands flood and drought for a long period.

Much of the structure of the soil is determined by its organic matter content which encourages active biological activity in the soil with constant release of available N, P and K. The action of breaking into the balanced environment immediately causes deterioration. Exposure to the atmosphere of the soil crumbs results in their breakdown, rain drops batter the soil, frost causes heaving of the soil and implements play their part also. It is necessary to be aware of these factors right from the start in order that remedial action can be taken.

Remedial action can be classed into three distinct sectors:

a) There is the situation of the small-scale grower with 10 acres or so who may be cropping 2 or even 3 crops a year especially in the North Island. Such a grower will probably be using soils of natural high fertility and strong structure. i.e. the strongly structured basalt soils of Pukekohe and the slopes of Banks Peninsula. Even though the soils are strongly structured attention should be given to the incorporation of organic matter in the form of rotted straw, compost or animal manures, chickens etc. In this way high fertility will be maintained despite intensive and continued cropping. The problem of diseases will remain unless a definite rotation of crops is developed. However, on such small areas soil sterilisation chemically is a possibility due to the high value of the crops usually grown.

b) The situation of the large scale vegetable grower. By large scale we mean those growers with over 10 acres under vegetables and often as much as 100 or 200 acres. On such large areas it is impossible to apply organics in sufficient quantities and alternative cropping programmes will be necessary. The use of green crops to rest the soil is advocated and rotation of crops with only one crop per year is probably an answer here. If no attention to soil structure maintenance is given in the early stages then even the strongest structured soils will eventually succumb to abusive use.

c) Finally we have the recent appearance of vegetable growing by the farmer particularly in association with the process industry. This development is particularly important at the present time in Canterbury where the soils are essentially weakly structured and soon break down under intensive cultivation. Here soil structure maintenance will be more critical than on the more strongly structured soils but farmers have the advantage of being engaged in a mixed cropping type of farming where crops follow on periods of grassland and animal production. The growth of grass is perhaps the most efficient way of restoring soil structure and it is to be hoped that the mixed cropping rotation will be maintained by farmers growing process crops.

A further advantage in Canterbury is the relative freedom of the land from those diseases which plague process growers in the North Island. This is a definite advantage which can and must be maintained by means of a wide rotation. There must not be a concentration of process crops close to the factory even though this may be economic initially. There are large areas within an economic distance of Christchurch suitable for process vegetables therefore let us utilise these areas and have wide distances in time and distance between crops. In this way disease built up in the district will be kept to a minimum and optimal crop spacings will not be dependent on disease control.

In addition high density cropping creates a rapid cover over the soil and provides a greater ploughable residue to maintain soil structure. Slides were shown to illustrate the points made:

1. To illustrate certain aspects of growing in an intensive area of vegetable production such as Pukekohe. From the air large areas were seen to be under cultivation leaving little room for a return to grass or green cropping.
2. The breakdown of soil associated with heavy equipment working on wet soil and point out how soil deterioration has led to only one crop being grown where two a year were normal. A green crop or barley has replaced the second crop.
3. The effect of rain on gently sloping land and pointed out the dangers of erosion.
4. The effect of water on good and poor structured soil gave a good indication of what happens to soils as they deteriorate.
5. Comparison between the Pukekohe soils which took 40 years to breakdown to a critical level and Canterbury soils which breakdown in only 5 years.

6. The effect of continuous cropping of the same crop compared to cropping in "clean" soil. Cabbage grown in old soils was heavily infected with "black rot", a bacterial disease, despite extensive spraying while a few miles away a crop grown following pasture was growing clean and spray free.

In conclusion let me reiterate the importance of soil structure and rotation in vegetable cropping. The build up of many diseases has become critical in widely spaced areas. Verticilliums, Fusariums, Sclerotinia, all play havoc in soils often as a result of too little attention to rotation.

Plant breeding is one answer to these problems, chemical sprays another and soil sterilisation yet another. All these methods cost money but a wide rotation does not, particularly in Canterbury where a mixed cropping system is already established.

Good soil structure leads to ease of management and maximum productivity. When destroyed it leads to general soil problems which cost money to remedy. Let us then learn from the mistakes of others and let Canterbury in particular take special note of these factors as it embarks on, we hope, a successful vegetable processing industry.

Finally a last thought for the day for Canterbury farmers embarking into vegetable production. Can you really afford to burn that valuable pea and cereal straw if you are thinking of intensifying your cropping for higher value crops? Perhaps irrigation and a bag of nitrogen will be more beneficial than the wasteful burn off.

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