



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*



GIANNINI FOUNDATION OF
AGRICULTURE AND ECONOMICS

WINTERBURN
LIBRARY CANTERBURY CHAMBER OF COMMERCE

APR 10 1963

AGRICULTURAL BULLETIN

"CREATIVITY - THE SECOND STEP IN DECISION MAKING"

No. 400

NOVEMBER, 1962

by A. T. G. McARTHUR, Senior Lecturer in Rural Education,
Lincoln College.

Introduction

In bulletin 394 I wrote about diagnosis—the first step in decision making. Here I discussed the important dimensions of a good diagnosis—defining the aim, identifying the key factors, and setting limits within which solutions to the problem must lie. This bulletin deals with getting ideas on how to solve the problem—ideas which will meet the aim, overcome the key factors, and fall within the limits which were defined in the diagnosis. With a list of ideas on how to solve the problem the farmer has to work out their consequences and then select the best one. I shall be discussing how to do this in later bulletins in this series on decision making.

Farmers usually draw on their own experience or the experience of others to solve their problems. Suppose a farmer wants to decide on the best tractor to buy. His experience with tractors, the experience of neighbours, information from farm machinery journals will provide him with a list of alternatives for consideration. Obviously a farmer must use as much first hand and second hand experience as he can, but experience has two common dangers.

Firstly there's the danger of saying to oneself "How did I handle this problem last time? We did so-and-so and it worked out all right so we'll do it again." By the time he has repeated this approach a few times with apparent success, the course of action will become a habit. Habit saves a lot of mental work but may not give the best answer to problems under changed circumstances. For example, a dairy farmer may calve his cows in August. This becomes habitual after a number of years, yet in the meantime he improves the winter grow-

ing capacity of his farm. It is then only too easy to overlook the alternative of earlier calving. The best antidote to habitual behaviour is to have the question "Isn't there a better alternative" continually running through the mind. The second danger of using past experience lies in dealing with the future and this is the planner's job. Past experience may have proved to you that it paid to invest all your surplus money in the farm but if prices look grim it might be better to invest this money outside the farm or pay off some of the mortgage. A good plan in the past may not be the wisest plan for the future.

Creative Thinking

Planning that adds some new, useful, and original element is creative. Obviously new ideas evolve from old ones but the creative process makes some step forward. Even Einstein's famous theory of relativity was based on an earlier mathematical system which assumed that the shortest distance between two points was a curve. However, his theory added something new by applying this older knowledge to explain the facts of the universe.

Conservatives recommend leaving the creation of new ideas to the crank, advising the average farmer to hold fast to the tried and true because new ideas can prove expensive. However, I believe that many New Zealand farmers are in fact creative to a greater or lesser degree. This is one of the vital factors in New Zealand farming efficiency. Where would New Zealand hill country farmers be if someone hadn't dreamed up aerial topdressing? Dairy farming would still be the drudgery of the twenties if a farmer hadn't thought that cows might yield just as well without hand stripping, or dreamt up the herring bone shed and then con-

ceived the round yard giving the world's most streamlined milking routine.

These are the big examples but the average man can be creative too. One can see samples of original ideas from farmers in each issue of the farming papers. Further, nearly all successful farmers have some original and special plan for their farms which neatly fits their particular circumstances and to this extent they are creative. In fact, every time a farmer tackles a problem he has the opportunity to be creative.

There is very little factual information on creativity but psychology suggests some useful leads. We will discuss these firstly from the negative point of view—the psychological barriers to creative thinking—and secondly with some suggestions for producing new ideas.

Psychological barriers

We often have difficulty with new ideas simply because of the way we perceive things. Try this problem. Take six match sticks and make four triangles so that the ends of the sticks touch. Most people start off arranging the sticks on a flat surface and find they can't do it. But as soon as they see the problem in three dimensions then the answer is obvious. They quickly build a pyramid with the six matches.

Let us look at a farming problem. Just recently a writer in the "Weekly News" suggested that New Zealand should consider converting some of its grass into high priced venison. Obviously this wild idea presents many difficulties. Research would have to invent a fence to keep the deer on the farm. Someone would have to determine the deer's efficiency of food conversion of grass to venison to compare it with dairy cows, sheep, or beef. But the trouble is we all perceive the deer as a pest ripe for eradication. Because of this perceptual block the chances of anyone taking up the idea of venison production is unlikely. Similarly, the electric fence was introduced to New Zealand before the war as a moveable fence for rationing feed to stock. This was how it was perceived and it took many years before we saw the possibilities of using it as a permanent method of subdivision.

The habit of transferring an idea to a new situation is one cause of perceptual blocks. Until Ferguson

came along with his hydraulic three point attachments for farm implements, we looked upon a tractor as a substitute for a horse. All implements therefore had to trail behind.

Again, because the calf drinks warm milk from the cow, we transferred the same idea to bucket fed calves. We insisted on feeding warm milk. The habit may also have transferred from warming babies' milk. Ruakura experiments have shown that calves grow equally well on cold milk and more recently experiments with babies proves that a mother can take the bottle from the refrigerator and thrust it into the infant's mouth with no ill effects.

The "either/or habit" also gives rise to perceptual blocks. It is so easy to see a problem as the choice between two clear cut problems. The possibilities are seldom as simple as this. For instance, you can either grow potatoes or grow peas. Neither may give you just what you want, nor fit in with the resources available on the farm. The best answer might be to grow as great an area of potatoes as you can within the limits of your labour force, and sow the rest of the ploughed grass in peas. At first there seems only two alternatives for using skim milk on a dairy farm—pigs or casein/milk powder. However, one can use skim milk for producing veal, beef, or rearing surplus dairy replacements, and I have seen a profitable duck-farming enterprise based on skim milk. The "either/or habit" blocks these alternatives coming into one's mind.

We also suffer from cultural blocks. Consciously or unconsciously, we tend to fall into line with the opinions and attitudes of the people around us. This is a desirable characteristic if we want to get a campaign for hydatids eradication under way, or want to use this group pressure to raise money for the local church, but it can have an inhibiting influence on the production of new ideas. For instance, on a marginally economic dairy farm, the best course might be to dispose of the tractor, get in contractors to do the topdressing, hay-making etc., and use a horse or cart for the feeding out and other small transport jobs. A farmer is unlikely to think of this alternative because it simply isn't modern. In fact I once had a prolonged discussion with the editor of a paper

on whether such a backward suggestion should appear in his columns.

Fortunately New Zealand farmers tend to be individualistic and possibly less susceptible to cultural blocks than elsewhere. Indeed New Zealand farmers share with scientists a large number of the honours for new ideas in farm efficiency.

Conditions for Creativity:

All of us have some creative talent, and it seems wise to see if we can gain some pointers on how this can be improved. Several psychologists* have looked at the conditions under which creative thinking occurs. In other words, what do people do when they think creatively? There seems to be four distinct phases—preparation, incubation, inspiration, and verification.

1. Preparation: In this stage the thinker gathers together all the relevant facts about his problem and works them over. This takes effort. It is a popular misconception that a man stumbles accidentally on new ideas. Usually he has all the necessary skill and knowledge, has a good mixture of practice and theory, and he hits the new idea after struggling with it for some time.

The analysis of problems into a series of smaller problems is one way of making them simpler to solve—a method first suggested by Rene Descartes (1596-1650) who founded modern philosophy. He wrote: "Those who do not use the analytical method are like a man who goes on a treasure hunt and spends his days running about the countryside in the hope that some passer-by might have dropped some treasure." As an example of the analytical method, farm management

people find it convenient to subdivide problems under the headings of land, labour, and capital, and their subdivision often helps them to think up new solutions. Work study experts divide up work into "operations" (when something is done), "inspections" (when something is inspected), "transportations" (when something is moved) and "delays" (when the operator has to wait). This division often simplifies the solution on how to speed the job and make it easier because the analysis makes the expert look for ways of cutting out delay and reducing transport to a minimum.

Dr C. P. McMeekan was one of the first to suggest an analytical approach to getting the maximum butterfat, wool or meat per acre. His approach is to divide this complicated procedure into three separate problems—the problem of growing the maximum amount of grass per acre, the problem of making sure that as much of the grass is eaten as possible with minimum wastage, and the problem of having stock which will efficiently convert the grass they eat into butterfat, or wool and meat. Advisory officers find this analytical method most helpful for making useful suggestions to farmers.

Having simplified by analysis, the next step is to look for possible re-arrangements and combinations. We mentally re-arrange all the stored information in our heads to see if we can get a flash of insight. The following questions are useful and may prompt a new idea:—

*(See Robert Thompson, "The Psychology of Thinking". Pelican Books.)

Question:

1. Can I use it for something else?
2. Can I adopt an idea from somewhere else?
3. Could I make it bigger?
Could I add something?
Could I do it more often?
Could I make it stronger?
Could I add an ingredient?
4. Could I make it smaller?

Could I omit it?
Could I make it lower?
Could I do it less often?

Example:

Could I use that old cow shed floor for a self-fed silage outfit?
Could I use the market gardener's planting out method for fodder beet instead of singling it?
Could I use a wide broom to sweep down the yard?
What about making another lid for my "double over" wool press so I can be filling up one side with wool while I'm sowing up a bale.
Could I manage with a smaller tractor?
Why feed calves twice a day—perhaps once a day would be often enough?

5. What could I substitute?
Who else instead?
What else instead?
Where else instead?
6. Could I rearrange it?
Could I have some other lay-out?
Could I have some other sequence?
7. What about combining it?

Could I hire seasonal labour instead of having a permanent man?

Why can't we put the dairy to one side and have a straight run through our new herringbone shed?

Could we do some lamb drafting, dosing, shearing and spray dipping in one hit?

2. Incubation: With a little bit of luck, the preparation stage may automatically give us all the ideas we want out of which we may find a suitable one. So far we have talked about "regulated" thought. However, the collected experience of creative thinkers suggests that they go through an incubation phase. They relax, turn off conscious mental effort and forget the frustration of not solving the problem. The phase is called the incubation phase because the mind seems to be hatching something. Sooner or later, if the preparation phase has been done conscientiously, we might get a flash of insight. This may happen at any time—while shepherding, tractor driving, milking the cows or at some other unexpected moment.

3. Inspiration: This is the sudden joyful perceptual rearrangement of the problem that gives us the new idea. There are several explanations of this incubation-inspiration process. One theory holds that unconscious mental work goes on during incubation—that is, one puts one's thoughts into the unconscious mind to let them "cook." Another theory says that the non-productive trains of thought tend to be forgotten, giving an opportunity for fresh ideas to appear. So often one idea dominates the mental scene, going round and round, excluding other combinations and arrangements of information.

4. Verification: At this stage, the newborn idea has to be taken out into the world of reality to see if it will work and how it compares with other alternatives. The architect verifies his design by drawing sketch plans; the engineer by building a prototype; the poet by writing

down his lines and seeing how they look; the scientist by designing an experiment to test his hypothesis; and the accountant by working out a budget. I shall enlarge on this question of how to compare possible courses of action in a later bulletin.

Fairly obviously the importance of each of these phases of creative thinking will vary from individual to individual and from problem to problem. Some problems will yield in the preparation stage while others will need incubation for a considerable period.

Finally, I would urge those who make decisions not to overlook this creative phase. Mostly the tried and true ideas from experience will be chosen ahead of the original idea especially when there is much at stake because of the risks involved. However, there is no harm in attempting to be original at first and then by tough, logical thought eliminate impractical suggestions. Every now and then you will find a winner. The ideal decision maker should have a dual personality. At one moment he should have a flare for new ideas—some wild and some sound—and later on he should be able to subject these ideas to rigorous criticism. The sound, practical man who excels at making the careful predictions of the outcome of a course of action and who can see all its pitfalls is frequently not so good at conceiving new notions. On the other hand, the "ideas-man" may not be much good at predicting outcomes. Consequently, the "ideas-man" thinks of the sound, practical man as a stick-in-the-mud and the sound, practical man looks at the "ideas-man" as a crank. There is room for both.

Copies of this Bulletin may be obtained from the Secretary, Canterbury Chamber of Commerce, P.O. Box 187, Christchurch.