

International New Crop Development Incentives, Barriers, Processes And Progress: An Australian Perspective

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...too often, new crop products are those that consumers do not need...
...incentives...often bear little relationship to the creation of value...
...windfall profits...a strong motivation behind much new crop participation...
...we will never hit a target unless we aim at it...
...the purpose of the purpose of the purpose...
...new crop development creates difficulties in managing risk...
...knowledge has context...
...everyone involved in a solution needs to participate in finding it...
...crops rarely attract support when they need it most...
...the commercialization of new crop products is chaotic...
...successful outcomes are unpredictable...
...there are no experts in new crops...
...new crop participants will benefit more from cooperation than competition...
...primary producers...production dominates their minds...
...participants...want to do better through designing their own future...*

INTRODUCTION

The objective of this review is to describe the general principles of new crop development from an Australian perspective. The incentives behind new crop commercialization and the barriers facing “participants” as they seek to create a successful product in the marketplace are examined.

A 13 step process has evolved in Australia over the past eight years to assist new crop participants with the task of commercializing new crop products. A preliminary 10 Steps for Planning process for individuals entering the new crop industry and the Do Our Own Marketing Research (DOOR Marketing) short course for small groups are also described.

A new crop industry's most valuable resource is its people. It is recommended that new crop participants throughout the entire value/demand/supply chain (“supply chain”; from producers to consumers) become their own “experts” in new crop development, train themselves and each other accordingly and cooperate in partnerships to facilitate the operation of viable supply chains.

DEFINITIONS

A new crop is a crop or crop product new to an area. New crop development is the adoption of a plant in a particular geographic region (for the purposes of production) so that it can be manipulated as a crop for the generation of some profitable commercial product (for the satisfaction of consumers) that has not previously been successfully produced from that plant in that region.

*Grateful acknowledgment is made of the contributions of the Rural Industries Research and Development Corporation and the Grains Research and Development Corporation through the funding of Project UQ-33A (1993-8) and other projects. Many thanks to Gary Jolliff, Colin Birch, Greg Ferguson, Nick Walker, Brett Reisenleiter and many others for helpful comments on earlier drafts of this document. As well, the collaboration and contributions of many colleagues and industry partners to this research and development is acknowledged, in particular to Greg Ferguson, Gerry Kregor and Chai McConnell, as well as Peter Twyford-Jones, Tony Sadler, Peter Blessing, Nick Walker, Alan Davidson, Sibylla Hess-Buschmann, the late Ian Wood and the late Lennox Davidson and representatives of the Queensland Grain Growers Association, Queensland Fruit and Vegetable Growers, Queensland Department of Primary Industries, New South Wales Agriculture, CSIRO Tropical Agriculture St. Lucia, Toowoomba Institute of Technical and Further Education, Australian Rainforest Bushfood Industry Association, Cooloolo Native Flower Growers Association and many private companies and individuals throughout Australia.

At least 67% of the increased value of crop production in Australia over the period 1950–1992 was derived from new crops (Chudleigh et al. 1994). In decreasing order of value, these new crops were cotton, lupin, mushroom, sunflower, broccoli, soybean, melon, canola, triticale, avocado, macadamia, chickpea, mango, kiwifruit, and almond (Wood et al. 1994).

Australia has an enthusiastic new crop development effort; in 1995, there were at least 154 new crop researchers interested in at least 160 different new crops (Fletcher 1995) and in 1996, 220 attended an Australian New Crops Conference (Fletcher 1997). However, many of these Australian participants are “recreational” researchers, pursuing new crops as a hobby (McConnell 1996).

Previous definitions of new crops have focused on production and/or consumer aspects and the “newness” of the crop (Wood et al. 1994). Categories have been suggested to define new crop development more realistically (Paarlberg 1988) and Wallis et al. (1989) proposed a matrix comparing the established/new crops/products categories. Each of these categories can be usefully redefined in terms of the challenge they represent to participants (Table 1).

The challenges of commercializing a genuinely innovative product from a new crop are significant (lower right quadrant, Table 1). Such challenges are being tackled by the Australian native food industry (Beal 1995; Cherikoff 1995, 1999; Hart 1997; Stynes 1997; Freeman 1998; Hess-Buschmann 1998; Anderssen 1999; Bailey 1999; Fletcher 1999; Hotson 1999; Ahmed and Johnson 2000; Cherikoff 2001; Hegarty et al. 2001). This industry currently comprises at least 500 active participants and has a gross production value (farm-gate and ex-nursery) of \$AUS 5 million (RIRDC 2001). At least fifteen plant species have been targeted (Table 2).

Most new crop development derives from the transfer of skills, knowledge, and germplasm from one place to another, with modifications to suit local conditions (upper right and lower left quadrants, Table 1).

It is these modifications which, if appropriate, render the eventual product marketable and the entire process viable. Unfortunately, there have been many cases of new crops being promoted without concern for their local adaptation; such promotions have sometimes been driven by short term entrepreneurial schemes focussing on outcomes for the promoters, rather than long term goals focusing on value creation for the participants.

PLANNING

It is difficult to frame realistic objectives for any new crop development. Whenever the viability of the primary industries sector is threatened, recovery is sought by increasing the efficiency of established rural

Table 1. The challenges confronting new crop participants compared with those of established crops.

<p>Established Crop Established Product Improved Production Effectiveness Product Market Penetration</p>	<p>Established Crop Innovative Product Improved Production Effectiveness New Industry Development Market Research New Product Development Product Market Penetration</p>
<p>New Crop Established Product Production Development Improved Production Effectiveness New Industry Development Established Market Research Product Market Penetration</p>	<p>New Crop Innovative Product Crop Diversification Production Development Improved Production Effectiveness New Industry Development Market Research New Product Development Product Market Penetration</p>

Table 2. The plant species targeted by the Australian native food industry (Graham and Hart 1997; RIRDC 2001).

Common name	Binomial	Family
Elegant wattle/ Prickly acacia	<i>Acacia victoriae</i> Benth.	Leguminosae
Lemon aspen	<i>Acronychia acidula</i> F. Muell.	Rutaceae
Aniseed myrtle	<i>Backhousia anisata</i> Vickery	Myrtaceae
Lemon myrtle	<i>Backhousia citriodora</i> F. Muell.	Myrtaceae
Davidson's plum	<i>Davidsonia pruriens</i> F. Muell. var. <i>pruriens</i> and <i>D. pruriens</i> var. <i>jerseyana</i>	Cunoniaceae
Wild lime/Desert lime	<i>Eremocitrus glauca</i> (Lindl.) Burkill	Rutaceae
Muntries	<i>Kunzea pomifera</i> F. Muell.	Myrtaceae
Rainforest lime/Native lime	<i>Microcitrus</i> spp. Swingle/ <i>Citrus</i> spp. Mabb	Rutaceae
Illawarra plum	<i>Podocarpus elatus</i> R. Br. ex Endl.	Podocarpaceae
Desert quandong	<i>Santalum acuminatum</i> (R. Br.) A. DC.	Santalaceae
Bush tomato	<i>Solanum centrale</i> Black	Solanaceae
Riberry	<i>Syzygium leuhmannii</i> F. Muell.	Myrtaceae
Mountain pepper	<i>Tasmannia lanceolata</i> R. Br.	Winteraceae
Kakadu plum	<i>Terminalia ferdinandiana</i> = <i>T. latipes</i> Benth. ssp. <i>psilocarpa</i> Pedley	Combretaceae
Warrigal greens	<i>Tetragonia tetragonoides</i> (Pallas) Kuntze	Aizoaceae

industries or increasing participants' income through the introduction of new crops, animal, or aquaculture industries. Established rural industries will usually appear to be a more attractive investment, since the expected outcomes can be accurately defined, in terms of extra production and/or income. Massive infrastructure is in place to do this. Although the proportional returns from such investment will fall as efficiency levels rise, a relatively modest increase in the value of current production (e.g. a 1% boost in an industry worth \$AUS 1.3 billion per annum) can often be worth as much as the total value of a new rural industry (i.e. \$AUS 13 million).

The new crops option is less attractive because most outcomes will be little more than guidelines or encouragement for further research. Speculative research objectives claiming sensational outcomes have attracted attention to new crops in the past but have rarely been achieved, creating disparaging publicity for the new crops industry. Innovations in any field of research will only be commercially successful if they are marketed as applications that satisfy the needs of the consumer. Too often, new crop products are those that consumers do not need or want.

INNOVATION

The principles and experience gained in the secondary industries sector from commercializing innovative manufactured products could be expected to provide a template for use with new crop development. However, such experience has been of limited use with new crop development in Australia in the past, because the budgetary conditions for innovative products in the secondary and primary industry sectors have usually been very different (Fletcher et al. 1997). For example: (1) innovative manufactured products have usually been created by large companies with large resources whereas new crop products have usually been developed by relatively small companies with limited resources; there have been instances of large companies supporting new crop products, but only after their viability had been demonstrated by others; (2) innovative manufactured products have often been developed from the industry's existing range of products whereas new crop products have often represented a major change from those products previously derived from a region in terms of crop species, production requirements, processing needs and/or the consumer needs targeted; (3) innovative manufactured products have usually represented only a small proportion of the firm's overall investment whereas new crop products have often represented a very large proportion of the participants' activity to the point where they can overwhelm the business/es entirely; and (4) innovative manufactured products have been

launched onto the market on a large scale with substantial promotional support, whereas new crop products have taken years to achieve substantial production levels and have often depended on publicity provided by others for their promotion.

The challenge for new crop participants is to demonstrate the viability of their new crop products through active partnerships with all other components in the supply chain. This requires a shared investment between all the supply chain partners with a view to sharing the risk but also requires the sharing of profits, which can be difficult for some new crop participants to accept. However, 20% of something is always better than 100% of nothing.

New crop participants in different positions in the supply chain can vary markedly in their exposure to risk and the level of protection possible. The primary producer is particularly vulnerable and there is little opportunity for her/him to externalize risk. As well, substantial numbers of primary producers are often required so that critical mass in terms of production can be achieved; late arrivals can take advantage of the contributions of earlier pioneers. Participants in other stages of the supply chain are more capable of protecting themselves, at least in the short term.

SKILLS

Most new crop development in Australia in the past has relied on the transfer of skills, knowledge and germplasm from overseas, with relatively minor local modifications only, such as crop improvement/breeding, the introduction of mechanization, marketing, pest control and/or agronomic modifications (in order of decreasing importance) (Wood et al. 1994).

When skills are not available from anywhere else in the world, commercializing new crop products is more demanding intellectually (requiring more time and money) and needs a much higher level of collaboration and cooperation. The Australian native food industry has been creating production and trade where there previously was none. To do this, the industry, over the past twenty years, has had to transfer skills from other crops and adapt them, or create them anew.

INCENTIVES

The incentives behind new crop development in the past have often not been commercial, that is, they have borne little relationship to the creation of value, directly. However, if personal motivation is realistically targeted in a commercial sense, appropriate community, regional, and national incentives can follow.

Personal Motivation

New crop participants are often motivated by a desire to improve or stabilize income over a region or on a single rural property. No commercial advantage can be derived over time from the growing of a new crop simply because it is new; the advantage of being unique is short term. To improve or stabilize incomes, incentives need to be commercially based, that is, new crop products need to create value by satisfying the needs of the consumer. New crop participants often cannot accept that a commercially successful new crop product takes time to develop and the risks are high. Public interest in new crops increases during crises, especially if sudden reorganization is being forced upon the primary industry sector. Such interest is encouraged by the news media with stories of potential “windfall” profits which cannot be verified or guaranteed.

The exhilaration of a chase after windfall profits is a strong motivation behind much new crop participation. New crop schemes promising instant returns are no different from any other scheme based upon rarity and ignorance. Participants need to be educated in the principles of marketing and should critically assess all claims made about new crops.

New crop development is often associated with the personal satisfaction derived from “recreational” research (McConnell 1995). However, the pursuit of a hobby will not have the budgetary rigor required of a commercial business; hobbies are for pleasure and pleasure usually costs money. The lifestyle advantages sought and preferred by many in some branches of primary industry need to be considered as costs to the individuals concerned.

Prospectus-driven and tax management schemes often feature new crops but commercially viable new crop products are not necessarily their principal motivation; such schemes provide flexibility for those with

substantial income tax obligations. The schemes are promoted in these terms. The new crop product itself often fails before it reaches the farm gate because the promoter and/or the manager do not have the skills, motivation or desire to properly nurture the development of the product (ASIC 1998).

The Principal Motivation

We will never hit a target unless we aim at it.

It is not easy for new crop participants to readily focus upon their principal motivation. One approach has been to derive the “purpose of the purpose of the purpose.” Repeated questioning of a participant’s purpose in this way can often identify the principal motivation.

The most frequently declared purpose amongst new crop participants in Australia, initially, has been their desire to introduce changes to their supply chains or their farming systems, before change is forced upon them. These changes are sought because the participants feel they can do better.

When asked the purpose of making such a change (that is, the “purpose of their purpose”), participants have usually indicated that the purpose of the purpose has been to design their own future or to improve their income (usually described as some form of windfall profit). The purpose for designing their own future (that is, the “purpose of the purpose of their purpose”) has frequently been to improve the value of their assets before the assets are eventually transferred to the next generation.

Such a range of purposes has often been derived from repeated questioning of the same participants; the differences in the responses may explain why the planning for new crop development so often appears to be quite arbitrary. However, the principal motivation, once identified, must be the most appropriate basis for subsequent planning.

Testing the future purpose has also been a useful predictor for new crop participants before they start on any new initiative. The future purpose examines whether identifying the principal motivation, pursuing it and achieving it in the time frame specified, represents a worthwhile accomplishment. For example, a desire to generate a profit of \$AUS 1 million from a new horticultural crop over the next fifteen years could hardly be viewed as an outstanding achievement, once participants look back in fifteen years and review the effort expended and the risks taken.

Community, Regional, and National Incentives

Community, regional, and national incentives will have some political motivation which may not be focussed on value creation. For example, new crop participants can frequently have hidden agendas driven by academic or other purposes, rather than by commercial interest (Fig. 1).

The principal personal motivation amongst a group of new crop participants will be a major determinant in the eventual success of commercialization. Participants will no doubt take advantage of any political inducements offered, such as regional development or industry re-adjustment funding, but this invariably distracts from the principal motivation.

BARRIERS

Principal barriers to the successful commercialization of new crop products include the high risks inherent in establishing a viable supply chain for a new crop product, the lack of reliable information about the available new crops options and the long lag period before profits are forthcoming, if they come at all (Ferguson 1994; Wood et al. 1994).

Risk

Managing risk with new crop development is difficult.

Risk is the chance of injury or loss; its size depends on the probability of the injury or loss occurring and its im-

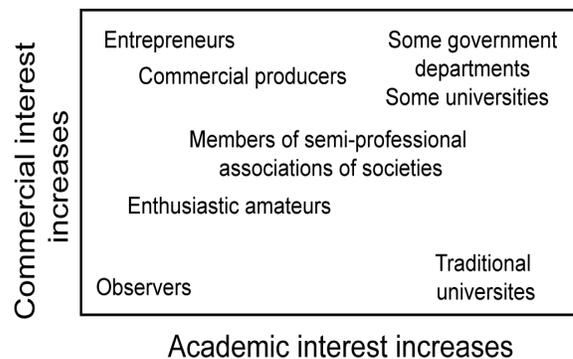


Fig. 1. Arbitrary comparisons of the commercial and academic interest of some of the likely

pact when it does (Buffier 1999). Internal risk (associated with production and personal injuries or loss) can be directly influenced by the skills and strategic planning of new crop participants. On the other hand, external risk (associated with marketing and economic factors) is more difficult to manage, often impossible to influence and in the case of new crops, impossible to predict.

External risk factors determine the ultimate commercial success of the new crop product. Attempts can be made to quantify external risk with sensitivity analyses using a range of potential scenarios but such analyses are often nothing more than speculation due to the lack of useful or accurate information (Fletcher et al. 1997).

The Do Our Own Marketing Research (DOOR Marketing) short course encourages participants to collectively derive SWOT (Strengths, Weaknesses, Opportunities and Threats) analyses on their proposed new crop ideas, using twelve important new crop development factors. The focus in the SWOT analyses is not on picking winners, but on a qualitative identification of any fatal flaws in a proposal. The intention is to find a reason to throw every proposal away; those which remain warrant closer examination for viability and potential commercialization.

Experience with the DOOR Marketing short course has also revealed there are several complementary gender-specific skills associated with the completion of such analyses.

Information

“...for nonlinear systems the whole is greater than the sum of the parts...no matter how many details are uncovered...” (Coveney and Highfield 1995)

“...humans have a remarkable ability to make rational decisions in an environment of uncertainty and imprecision...” (Zadeh 1988)

“...in a complex system...our act of trying to obtain the information, just our presence, perturbs a system in unpredictable ways...” (Briggs and Peat 1999)

The Australian Securities and Investments Commission (ASIC 1998) demonstrated the power of the media report in April 1998 when it published three bogus advertisements describing bluebottle farms, goat/sheep cross breeding programs and land and airspace packages around airports. Each advertisement included the words “Please note: this is not a real investment” and a free 1300 telephone number. Within weeks, 872 calls were received and 584 of these callers requested more information. The romance of windfall profits (in this case a purported 30%–50% profit on investment) readily attracts attention.

“Information” can be envisaged as part of a range from media reports to wisdom, each of which varies in terms of its availability and usefulness to new crop participants (Fig. 2). New crop media reports are plentiful, since they are used by new crop participants as a cheap form of publicity. Such reports encourage awareness of a new crop and its products and are often the stimulus that encourages potential participants to become involved. However, the factual content or relevance of media reports cannot be assumed, especially removed from the context of the circumstances reported.

New crop ideas are extremely plentiful but an idea has little value by itself. Several related ideas become an opportunity once they have been combined by mutually supportive partners. As well, participants who fail to share their ideas with appropriate partners invariably miss out on the benefits that commercialization can bring.

Most information available to those seeking to commercialize a new crop product is probably of no value to them and some of the information can seriously mislead. Information requires the context of a

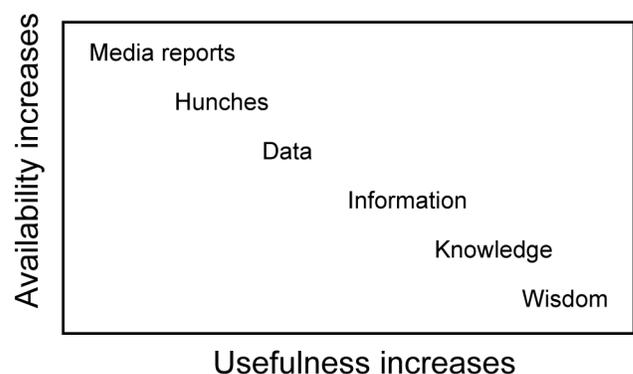


Fig. 2. The continuum from media reports to wisdom in relation to availability and usefulness.

relevant supply chain to be useful.

Knowledge is more valuable than information because knowledge has context; in the case of new crops, the context is the new crop product's supply chain. Isolated new crop media reports, hunches and data (Fig. 2) are only useful once they have been converted into knowledge. The development of new crop knowledge requires input from participants representing each component in the appropriate supply chain. Everyone involved in a solution needs to participate in finding it. The integration of this information in context requires systems thinking.

Systems Thinking

"...systems thinking enables one to progress beyond seeing events to seeing patterns of interaction and the underlying structures..." (Bellinger 1997)

"...a system is an entity that maintains its existence and functions as a whole through the interaction of its parts...you cannot understand the whole system properties by breaking the system into its constituent parts..." (O'Connor and McDermott 1997)

"A reductionist approach to new crop development is not useful since integration of the supply chain system from producer to consumer is required. A reductionist analysis of the economic advantages of new crop development will often reduce to an analysis of competition; a systems analysis on the other hand accommodates cooperation and coevolution as well." (Briggs and Peat 1999).

Profits

It is impossible to estimate future demand and price levels for any new crop product, because new crop market systems will almost certainly be chaotic. The dynamic nature of the market response to new crop products renders the relationship between such factors as supply, demand and price very sensitive. As well, many new crop products do not easily substitute for others. For these reasons, the 13 Step approach to commercialization tests a new crop product in the marketplace itself; to reach this stage, pre-feasibility analyses of a number of key factors are required. Such analyses do not seek winners but seek reasons to abandon a new crop product.

LIFE CYCLES

Crops rarely attract support when they need it most; speculators support a new crop idea before it has any valid commercial basis and the establishment protects established crops once their profitability begins to decline (Mizrahi 1995).

Wood et al. (1994) plotted the growth of the 35 new crop industries developed in Australia since 1950; for most, their growth responses could be accommodated somewhere in Fig. 3. The initial curiosity growth and the problem plateau stages are usually the responsibility of the new crop industry itself; once through recovery, recognition comes and the industry is substantial enough in size (and reputation) to warrant some externally funded research.

The Rural Industries Research and Development Corporation (RIRDC) has been the only funding organization in Australia to consistently support new crops. In 1999–2000, the corporation invested \$AUS 21 million to fund 600 projects over a wide range of new rural industry topics in Australia (RIRDC 2001). Other federal, state, and local government support is available for development projects which may include new crops but such funding in Australia is usually attracted by individual industries sufficiently well organized to lobby effectively.

An established crop product life cycle (Fig. 4) can last from 17–50 years (Mizrahi 1995). Financial support is crucial in encouraging success at the introduction stage (Fig. 4; these stages are probably equivalent to the recovery stage shown in Fig. 3) but such support is more likely to be attracted from external sources during the more mature stages, when profitability is low (Mizrahi 1995).

NEW CROP DEVELOPMENT

Predicting “Best Bets”

Attempting to predict new crops which are likely to be commercially successful is probably a waste of resources. Wood and Fletcher (1998) reviewed the prediction methods used by a number of organizations (including RIRDC, the Australian Centre for International Agricultural Research (ACIAR), the Commonwealth Scientific Industrial and Research Organisation (CSIRO) and the Tasmanian Department of Primary Industries and Fisheries). The authors concluded that factors of importance included the current or latent market demand, the opportunities for market development and product quality improvement, the expected profitability given existing technology, the opportunities for productivity enhancements through improved technology, the relative ease of overcoming industry constraints and the relative benefits from overcoming constraints.

Unfortunately, predictions of any of these factors, especially by anyone outside the appropriate supply chain, are mere speculation. The choice of “best bets” is easily influenced by issues unrelated to commercial viability, such as income tax management needs, regional development priorities or sheer curiosity. Real issues are often paid little or no attention once the “hype” (hyperbole or exaggeration) around a “fad” new crop builds.

The 13 Step process described below leaves the choice of new crop to the participants on the basis that, if they are sufficiently self-motivated, it is easier to learn new things if the subject matter, in this case chosen by them, is interesting and relevant.

Prediction and Chaos

“...does the flap of a butterfly’s wings in Brazil set off a tornado in Texas?...” (Lorenz 1993)

“...compromises are worse than defeat...stereotypes hardly ever fit the particulars...using them contributes to an atmosphere in which they dominate our thinking and distort our interactions...” (Briggs and Peat 1999)

The commercialization of new crop products is a chaotic system and hence outcomes from the process are unpredictable.

Commercialization depends upon a myriad of factors, many of which will only have an influence once the new crop product enters the actual marketplace. Such a system is chaotic for the following reasons: (1) it is unstable; (2) there are constantly changing factors which can influence the outcome; (3) the factors interact with one another; (4) the influence of many of the factors is likely to be non-linear and/or discontinuous/intermittent; (5) the system can be highly responsive to a small change in one factor; and (6) there are feedback and regulatory mechanisms operating, whereby past behavior can influence future behavior.

A chaotic system cannot be manipulated or controlled or its outcome predicted; alternatively, a subtle change in a single factor may exert a very large (yet unpredictable) influence on the outcome. A systems

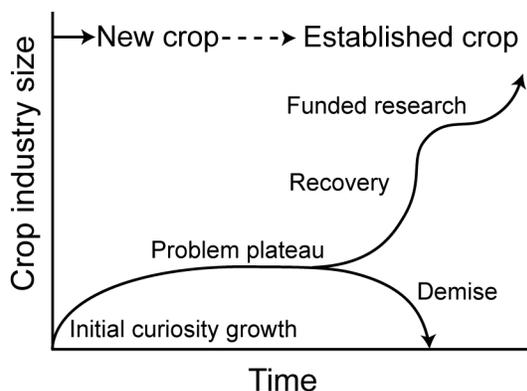


Fig. 3. A hypothetical new crop development scenario over time.

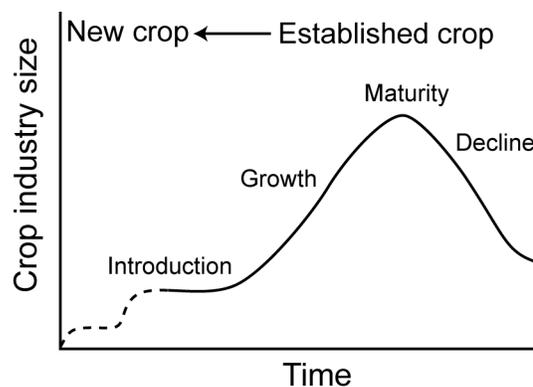


Fig. 4. Traditional life cycles for an established crop industry (Fletcher et al. 1997).

approach to new crop development permits development within the context of the supply chain. Test marketing of actual new crop products measures their marketability directly.

The Constructivist Approach

The constructivist approach to problem solving with new crops has been found to be far superior to the traditional transmission approach. Constructivism encourages motivated participants to collectively learn about a topic of mutual interest. New crop participants are more likely to achieve a mutually beneficial outcome to a problem by pooling their thoughts and cooperating in the finding of solutions. This approach encourages collaboration and cooperation whereas the traditional transmission approach often fosters competition. Constructivism encourages participants to interact on a level playing field, whereas the transmission approach encourages a hierarchical relationship between participants, often associated with the introduction or appointment of “experts.”

There are no experts in new crops. Instead, new crop participants need to cast themselves in the role of experts, since they have experience in the operation of their established farming systems or the supply chain components, into which the new crop product needs to fit, perhaps after some modification.

Participants in the past have depended upon the “trial and error” approach to new crop development; unfortunately, this approach is costly and focuses more on the trials themselves than their expected outcomes; carefully framed hypotheses require some idea of the product’s marketability if trials are to provide meaningful outcomes. Constructivism encourages participants to “...*design their own future...the judgement mode of the last millenium restricts us to past successes...it was never designed for change*” (de Bono 1999).

Cooperation and Game Theory

“...in civilised society he [man] stands at all times in need of the cooperation and assistance of great multitudes...by pursuing his own interest he frequently promotes that of the society more effectually than when he really intends to promote it...” (Smith 1776)

“...One oarsman on his own cannot win the Oxford and Cambridge boat race. He needs eight colleagues...” (Dawkins 1989)

“...Individuals who are acting entirely in their own interests thrive best by doing whatever meshes in with what others are doing...” (Tudge 2000)

Because of the nature of the supply chain and consumer needs, new crop participants will benefit more from cooperation than competition. Research into game theory has demonstrated that cooperation between partners will be more mutually beneficial than competitive options (Dawkins 1989; Tudge 2000). The prisoner’s dilemma is the simplest model in game theory: if two partners are participating in a “game,” what would be the benefit for each partner from cooperating or for one or both partners to double-cross the other? If the partners cooperate, it is assumed that each will get a “reward” of three units; if each partner fails to cooperate, each is “punished” and receives only one unit each; if one partner fails to cooperate by doublecrossing the other and the doublecrossed partner cooperates, the non-cooperative partner gets the “temptation payoff” of five units and the doublecrossed partner is left with the “sucker’s payoff” of nothing at all.

For single transactions, competition is obviously preferable to cooperation, since there is a temptation payoff of five units. However, modeling of the outcomes from a long series of such interactions by many authors has revealed that cooperation produces the most beneficial outcomes overall, provided: (1) partners have a stable long-term relationship, rather than a casual or opportunistic relationship, (2) reputations for cooperation can be established and recognized, (3) there is immediate and finite punishment for non-cooperation, and (4) there is an opportunity for those partners who have been punished to re-establish their reputations for cooperation; this is especially important if random mistakes are possible.

In larger groups, the punishment of those who do not cooperate is important and enables “free-riders” to be excluded. However, there also needs to be punishment for those who fail to mete out such punishment. All these outcomes are improved if partners have some kind of close family relationship. Hence, the individual-

ism that is so often characterized with entrepreneurship and innovation is at odds with the cooperation and consultation required to render innovative ideas commercially successful. Thus, “...we all pay the collective price for individualism...” (Ridley 1997)

THE NEW CROP DEVELOPMENT PROCESS

“...in academic life, in bureaucracies, and elsewhere, we encounter a lack of respect for the task of integration...” (Coveney and Highfield 1995)

The new processes encouraging commercialization of new crop products in Australia assist with: (1) personal analyses of the role of new crop diversification (The 10 Steps for Planning); (2) community action (Diversification Workshops using the DOOR Marketing (Do Our Own Marketing Research) Approach and Networking); and (3) new rural industry development (The 13 Steps for Commercialisation of New Rural Industries).

The 10 Steps for Planning

This process has evolved as a personal analysis of the role that any individual may play in new crop development. Each “step” is presented as a criterion and a question.

1. The participant’s current situation. Question: Are you a contented person?
2. The participant’s principal motivation for change. Question: What is your interest in new crops?
3. Personal skills. Question: What do you enjoy doing?
4. Commitment. Question: Have you chosen a new crop to which you are willing to commit money and time?
5. Information available. Question: Do you have easy access to germplasm and useful information?
6. New crop supply chain. Question: How do you describe the new crop product to be sold?
7. Market research. Question: What is the marketability of the new crop product?
8. Production. Question: Will the new crop grow in your area?
9. Personal factors. Question: Are you contemplating forming a group to grow and market the new crop product?
10. Economics. Question: Have you formed a group already and if so, what is its structure and how will it function?

This exercise has also been used early in the first day of the DOOR Marketing short course.

The DOOR Marketing (Do Our Own Marketing Research) Short Course

DOOR Marketing has usually been presented as an action learning short course comprising a 1+1 day Diversification Workshop for groups of up to thirty motivated new rural industry participants (producers to consumers) at a time. The core activity of the DOOR Marketing course is pre-feasibility market research for the new crop industries chosen by the participants themselves. The course does not replace the need for business plans but assists new crop participants in determining whether their selected new crop product warrants investment in such plans. There is usually a break of two to seven weeks between the first and second days of the course so participants can complete their “homework.” A key role is played by the facilitator of the course; a good facilitator is not required to know anything of the subject matter, listens to everyone, motivates no-one, initiates nothing, responds only if asked and enjoys seeing others succeed (Sirolli 1995).

The DOOR Marketing program consists of the following:

1. Introduction of participants

Psychological research has indicated that primary producers tend to be “loners” (Shrapnel and Davie 2000). Production dominates their minds. It can therefore be difficult for them to think laterally “past the farm gate” and to collaborate in new crops planning. Experience with DOOR Marketing short courses and similar situations throughout Australia has indicated that appropriate introductions are essential for significant interaction, mutual learning, and “bootstrapping” (learning by recall after indirect prompting from others).

At the commencement of the course, participants indicate their names, affiliations, reasons for attending, and expectations for the course. Each person also nominates a new crop/rural industry upon which to focus

her/his attention. The facilitator vigorously interacts with all participants during these introductions and encourages the participants to interact with one another as well.

As a result, each participant knows something about every other participant, each is able to speak about themselves, each experiences the difficulties of publicly committing to a single new crop for the course and the participants realize they share the same problem; namely, they want to do better through designing their own future.

2. *The 10 Steps for Planning*

This exercise has already been described.

3. *Systems exercise*

To encourage systems thinking, a series of generic questions has been designed around future scenarios, involving likely information sources, the participants' principal motivations, the physical and economic environment, the availability of colleagues and partners, the types of inputs required, including equipment and technology, and the outcomes sought. The scenarios include wishful thinking, adaptations for reality, local modifications, and likely action plans. This exercise encourages lateral thinking and encourages each participant to consider likely relevant sources of information for the modification of her/his system.

4. *A Brainstorming Session on the Types of Information Required*

Participants cooperate in a brainstorming exercise to identify the types of information required to bring their new crop developments to reality; after the session, each type of information is classified as a marketing, economic, research, and/or production issue and the marketing issues are ranked for perceived importance. Invariably, external issues predominate, with market research perceived as more important than consumers, competition, or the business environment.

5. *Strategic Marketing Management*

Strategic marketing management (Aaker 1995; McConnell 1996) asks the question: What market conditions are necessary to stimulate the commercialization of new crop products? The questions in Table 3 comprise the outline of the "homework" for participants and once attempted, permit the completion of a SWOT analysis during the second day of the course.

6. *SWOT Analysis*

The second meeting commences with another introduction session with similar questions, focussing on a new crop product and the outcomes of the homework. The SWOT (strengths, weaknesses, opportunities and threats) analysis examines the twelve factors considered to be significant from previous courses (Fletcher et al. 1997).

If participants identify any threats in terms of customer demand, current market price, industry trends or production factors or any weaknesses in terms of expected returns ("fatal" choices; Table 4), how can such proposals be considered viable? Approximately 90% of the initial proposals from participants in DOOR Marketing short courses so far conducted throughout Australia (and in New Zealand) have been abandoned by them as a result of such findings. Most participants have then repeated the process, focusing on other products from the same new crop and/or other new crop species.

The principles behind the DOOR Marketing course, as described, can be summarized as follows: (1) new crop participants cast themselves as experts in their own farming systems or supply chain components and cooperate with others in their supply chain to find solutions; (2) participants need to focus on their principal motivation; (3) there is no pre-determined outcome; and (4) participants own the outcomes themselves.

Groups pursuing new crop goals together are offered the 13 Step approach to commercialization which has assisted many in new crop development.

The 13 Steps for Commercialization of New Rural Industries

"...the more chaotic the system...the most compact way of simulating its behaviour is to observe the process itself..." (Coveney and Highfield 1995)

Since it is impossible to predict the outcome of a new crop development initiative, the 13 Step process encourages a group to enter the marketplace with a product, under a strict set of benchmark and monitoring conditions, to test its marketability directly. The 13 Steps are as follows:

Table 3. The outline for a Strategic Marketing Management investigation for a new crop participant (adapted from Aaker 1995).

External factors	
<i>Customers</i>	Who are our customers? Are the customers a uniform group? Will the product satisfy our customers' needs? What is our customers' motivation in buying the product? What are our customers' unmet needs?
<i>Competitors</i>	Who are our current and potential competitors? Is our product likely to encourage fierce competition in the market? Are our competitors a uniform group? What are the characteristics of our competitors?
<i>Market analysis</i>	What is the size of the market? How long is the product life-cycle expected to be? What will the profitability of the market be? What are the cost structures along the supply chain? What distribution channels will be used for our product? What are the overall market trends?
<i>Environment</i>	Are there any key success factors within the industry requiring attention? What important forces outside our company and the immediate market may have an effect on success of the new crop product? Is it possible to develop optimistic, realistic or pessimistic scenarios? What areas of information are currently limited, requiring attention?
Internal factors	
<i>Performance</i>	What measures for profitability and performance should we use?
<i>Strategic options</i>	What kinds of strategies have we used in the past? Do the strategies need to change in the future? What is our company's sustainable competitive advantage? What are our problems? How will these problems be overcome? What are the financial resources available? What business are we in? What type of enterprise are we? What is our strategic vision?

1. the proposal of the new crop by those willing to commit themselves financially to such development;
2. the acknowledgment that new crop development is a high risk adventure;
3. the recognition of the need to protect intellectual property rights;
4. the assessment of the marketing potential of the new crop product, using all relevant available criteria with an indication of those criteria for which no information is available;
5. a theoretical assessment of the production potential of the new crop using all relevant available criteria with an indication of those criteria for which no information is available;
6. the establishment of an integrated development group comprising producers, processors, distribution, and marketing partners with research providers in a facilitation role;
7. agreement within the group of resource requirements, expected outcomes, action plans to achieve them, and proposed distribution of any profits;
8. the establishment of a process of project monitoring to identify and resolve problems quickly and efficiently;
9. the establishment of economic benchmarks and an agreement to abandon the proposed development if these have not been met;

Table 4. SWOT analysis conducted at the conclusion of the DOOR Marketing short course (clear boxes are addressed; Fletcher et al. 1997).

Factors	Strength	Weakness	Opportunity	Threat
Customer demand				Fatal choices ^Z
Competition				
Start-up costs				
Current market price				Fatal choices
Expected returns		Fatal choices		
Industry trends				Fatal choices
Promotional strategies				
Distribution strategies				
Experience				
Resources				
Commercialization				
Production factors				Fatal choices

10. the establishment of a system of review to determine whether the development is worthwhile and to analyze the critical contributions for success or failure;
11. trial production for trial marketing;
12. trial production for trial processing and packaging; and
13. experimental production, using regional randomized replicated trials.

Commercialization of successful products from new crops in the past has often started with step 13, above. Any experimental trials conducted prior to the completion of steps 1 to 10, should be considered recreational research.

Much of the research used to develop the 13 Step process has been supported by RIRDC; the Corporation was created by Australian Government statute in 1990 to enhance innovation in the rural sector and foster new rural industries (RIRDC 2000).

PROGRESS

“...progress is often little more than a fad or fashion that substitutes one product for a newer one...”
(Briggs and Peat 1999)

New crops have made a significant contribution to Australia’s development since white settlement in 1788 and the direct contribution since 1950 has been substantial. However, new crops are often associated with spectacular losses through windfall profit schemes which prey on unsuspecting victims. The 10 Steps for planning, the DOOR Marketing short course and the 13 Steps for commercializing new crop products have so far proven useful throughout Australia in encouraging a more circumspect and cooperative approach to new crop development.

CONCLUSIONS

The future viability of new crop options cannot be predicted accurately. This is because marketing and economic factors are chaotic in their behavior. The 13 Steps empower the members of a new crop industry to collectively focus their goals and pursue them. Groups identify consumer needs, describe the new crop product, establish the components of their supply chain and then enter a commercial market, once appropriate benchmarks for their investment, growth and returns have been set. Such an approach encourages many new industry-driven niche industries, each of which can determine its own needs in terms of future research and development. Some of these new crop industries may eventually prove to be commercially significant over large areas. Trying to predict the latter has proven to be a waste of resources. A new crop industry’s most valuable resource is its people.

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