IT'S NOT EASY BEING GREEN:

THE DEVELOPMENT OF 'FOOD SAFETY' PRACTICES IN NEW ZEALAND'S APPLE INDUSTRY

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INTRODUCTION

This paper provides an introduction to New Zealand's apple industry through a review of different approaches to producing 'fresh' and 'environmentally safe' fruit. Two broad objectives are identified. First, to explore different production systems used to enhance New Zealand's environmental or 'food safety profile'. While the New Zealand apple industry has long been recognised for its high quality fruit, the last five years have witnessed increased pressure from consumers, buyers and trade regulators to formalise 'safe' production practices that guarantee minimum consumer risk through unacceptable chemical residues. Integrated Fruit Production (IFP) and Organic Fruit Production (OFP) represent philosophically related, but technologically different methods of 'greening' New Zealand's apple industry. Second, the paper examines some political and ideological agendas by various industry participants to promote and capture, 'green marketing' advantages. The analysis points to the fact that the 'politics of green' are complex and that ideological struggles over production practices reflect wider questions about the nature of New Zealand's national co-operative industry structure and single channel marketing.

Exploring the dynamics and interpretations of 'safe' food production introduces questions about who governs and directs actions concerning land use, production practices and the terms of 'sustainable' industry participation. This paper uses the case of the New Zealand apple industry to highlight the difficulties inherent in attempting to strike a balance between globalisation critique and locality-driven analysis. We argue that 'greening' dynamics within the New Zealand apple industry strongly highlight the multiple scales and processes that influence the restructuring of, in this case, the New Zealand Fresh Fruit and Vegetable (FFV) sector, but more broadly also speaks to wider methodological challenges in agri-food theory. This paper will argue that for apple growers in New Zealand, the question of how to be green brought into play a range of political, regulatory, geographical and biophysical constraints which suggest that agri-food theory needs to re-theorise 'scale' and industry regulation as process-based, socially (re)produced and contested.

CONCEPTUAL PLATFORM

This paper builds on previous research evaluating FFV in the context of food regimes, food networks and agri-commodity chains (Le Heron and Roche 1995, 1996; Roche et al. 1999; McKenna, Roche and Le Heron 1998, 1999; McKenna and Murray forthcoming; McKenna 1999b; Grosvenor, Le Heron and Roche 1995; Moran, Blunden and Bradley 1996a, 1996b *inter alia*). One related arena of interest to the agri-food analysis of FFV has been debates about food safety, 'green' production practices and 'fresh' produce and how these tie into other agri-food discussions concerning the 'agrarian question' - particularly the dynamics of organic production as it represents a shifting, and at times misrepresented, mix of simple commodity production and capitalist modes of production (Campbell and Coombes 1999; Coombes and Campbell 1998; Buck, Getz and Guthman 1997; Tovey 1997; Whatmore 1995; Peck and Tickell 1994a, 1994b). Representing a diverse literature and multi-disciplinary interests, research on the global FFV complex has identified numerous contemporary trends, including:

(1) increased consumer concern with food safety;

(2) the 'greening' of corporate food producers' images and production practices;

(3) formalised and wide ranging guidelines prescribing food qualities at various organisational scales;

(4) the movement of large-scale capital-intensive food producers into 'low intervention' and 'organic' production systems, and;

(5) the continued use of 'sustainable' discourses to define production and consumption trends.

This evaluation of 'globalised' and 'safe' production practices in the FFV complex has also opened up important debates about how local (subnational, regional) farming practices, industry organisation and social relations are being restructured and rescaled. Therefore, it is possible to argue that the analysis of FFV incorporates some of the key dynamics in the contemporary restructuring of agri-food systems. It is, therefore, not surprising that so many key theoretical debates in agri-food analysis have been applied to FFV analysis.

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The concept of 'food regimes' (Friedman and McMichael 1989; Friedman 1993) has been a dominant theme in much of this discussion of FFV, linking macro-scale, systemic changes in world food economies with restructuring processes among nation states (McMichael 1994, 1996, 1999; Roche 1999; Le Heron and Roche 1995; McKenna et al. 1998). Where food regimes theory has encountered criticism is in the way the concept offers only passive clues about regional and local specificities in the value construction of food, farm practices and regulatory mechanisms (Goodman and Watts 1994; Moran et al. 1996a, 1996b; McKenna and Murray forthcoming). Further, 'global' and 'macro-scale' discourses can obscure attempts to theoretically engage nature with bio-politics and regulation in exploring the highly contested politics of agri-food networks and 'green' production practices (Goodman 1999; McKenna and Murray forthcoming; Campbell and Coombes 1999; Coombes and Campbell 1998).

The recent criticism of food regimes theory, and the unresolved debate over a transition to a third food regime based on 'fresh' concepts (Le Heron and Roche 1995), has left agri-food research with something of a theoretical lacunae. While agri-food research needs to operate within frameworks like commodity systems or food networks that transcend isolated spatial and temporal sites, Campbell and Fitzgerald (2001) argue that there is no clear consensus as to how this might be achieved. At least three responses within agri-food theory have been made. The first is from those who have abandoned structural analysis in favour of collapsing analysis to the post-structuralist level of discourse (Whatmore, 1995; Marsden, Murdoch, Lowe, Munton and FLynn 1993; Cloke and Little, 1997; Murdoch and Marsden, 1994). Second, the challenge of overcoming the nature/culture binary has been attempted through re-embedding bio-physicality into agri-food systems. This has prompted a strong engagement with the Latourian-inspired notion of food networks (Goodman and Watts 1997; Lockie and Kitto 2000), although, as Lockie and Kitto (2000) argue, proposing that food networks analysis can overcome binaries of nature/culture and actually achieving it are two different things.

Third, and finally, this paper takes up a question that has been less often posed in response to the recent disruptions within agri-food theory. Namely, where did the demise of food regimes theory leave us in relation to issues of scale? We suggest that while some aspects of food regimes theory are now considered to be less relevant, the idea of the food regime can still play an important role in prompting some interesting geographical debates in agri-food research through explicit inclusion of geopolitical concerns and time-space comparisons in theorising analytical 'scale' (McKenna and Murray forthcoming; Roche, McKenna and Le Heron 1999; Roche 1999).

Clearly, recent attempts by agri-food theory to supersede the food regimes approach have struggled to situate analysis firmly within any particular *scale* of activity. Both the food networks approach and the persistent tradition of commodity systems analysis raise questions about scale that are not explicitly addressed. We argue that contemporary world-scale trends in food production, valorisation and consumption have no prescribed pattern, uniformity or inevitable trajectories. Consequently, this paper contends that scale is best understood as something that is process-based, socially produced and contested. Far from being an ontological 'given' with neutral discursive meaning, scale is both the arena and moment where power relations are contested, negotiated and regulated (Swyngedouw 1997; McKenna and Murray forthcoming). Swyngedouw (1997) uses the term 'glocalisation' to encompass simultaneous and contested processes of political-economic transformation that reflect 'global' trends in food economies and contextually bound regional/local discourses shaping power and productive relations within FFV commodity chains. Further, this paper will demonstrate how issues of scale are often bound into bio-physical relations within production.

We contend therefore, that a key component in understanding the 'global-local' relationships shaping FFV dynamics and the notion of 'greening' food industries, can be uncovered in the politics structuring scale which are simultaneously constituted through material production and metaphorical meaning.

Already, research into the apple - and wider organic - industries has revealed these kinds of tendencies. International evidence suggests that 'safe' food and 'fresh' discourses have, to a large extent, been incorporated by capitalist interests and converted into systematic efforts to create economic advantage for specific producers in lucrative markets (Buck et al. 1997; McKenna et al. 1998; Tovey 1997). Such explanations are insufficiently sensitive to the politics of scale. In the New Zealand apple industry orchardists often find themselves reacting to 'sustainable' discourses that emphasize economic goals to the virtual exclusion of more integrated socio-environmental and economic ideologies about alternative food production systems (McKenna et al. 1998). Given that the New Zealand apple industry has developed from a 53 year history of a national grower co-operative, orchardists have significant and direct input into the economic, political and social operation of their industry. In other words, there is active and significant 'local' involvement in managing and interpreting the impact of 'global' market forces shaping industry change, marketing and production practices.

Following Coombes and Campbell (1998), it is evident that making universalistic assumptions about the relationship between capital and industry greening tends to occur at the expense of recognising national and regional diversity in orchard practices and industry regulatory mechanisms. 'Large-scale' capital interests do not necessarily marginalise or 'subsume' smaller organic producers as is often assumed in prioritising the 'global' in global-local dialectics relating to agri-food networks (see Buck et al. 1997). Similarly, New Zealand's apple industry, encompassing 1,600 growers is dominated by small family based orchards of 10-12 ha (McKenna et al. 1998, forthcoming). Less than 5 percent of growers currently produce organic export fruit, with the remainder of the national export crop grown in through 'environmentally safe' integrated fruit production (IFP) systems. Indeed, local input and the embedded social characteristics of alternative or

'green' agriculture movements are increasingly important in maintaining its present legitimacy with growing numbers of consumers (Campbell and Liepins 2001).

Combining discussion of scale, industry greening and agri-food research we contend that 'green' and 'fresh' food discourses are embedded in political-economic transformation characterised by parallel and simultaneous movements to smaller and larger scales. In fact, we suggest that building an understanding of these constant and contested transformations demands a conceptual framework that does not theoretically favour any particular geographical scale. There is a tendency within agri-food research to allow scale-related explanations to define particular sets of ideological and political positions related to 'global-local' dialectics. We demonstrate here that industry regulation and organisation actually represent moments in constantly fluctuating socio-spatial discourses. It may be useful therefore to view agri-food systems as non-hierarchical and encompassing a series of simultaneously 'nested' relationships which incorporate interconnectedness and overlap.

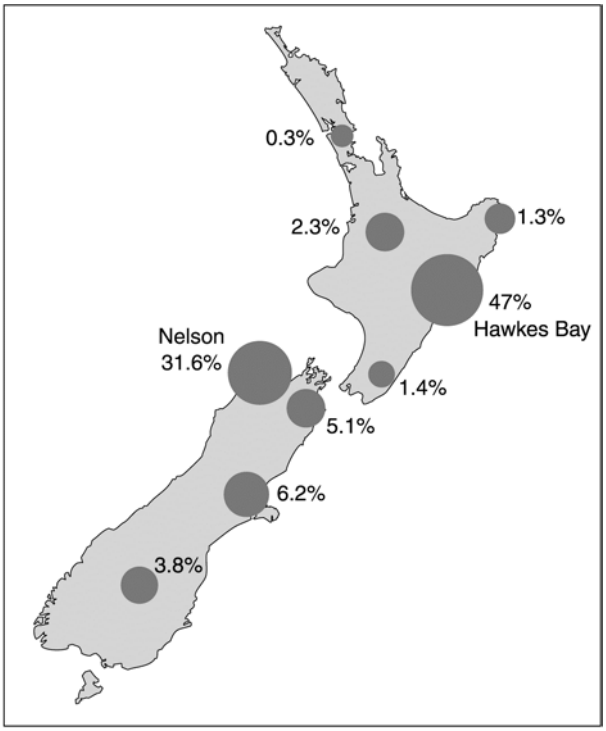
In this paper, we suggest that competing global-local processes structure the discursive terms of apple industry greening in New Zealand. 'Global' trade agreements and consumer preferences are structuring orchardists' production choices geared towards 'environmentally safe' foods. At the same time, 'local' growers are choosing between IFP and OFP practices which represent different (often contentious) approaches to industry greening and expose tensions among growers concerning the best way to regulate industry functions and marketing. Our research centres on how competing and complimentary practices reflect the complex politics of regulation and scale in shaping options for apple industry 'greening'. Before discussing industry 'greening', however, the next sections outline some key aspects of New Zealand's apple production and sector organisation.

THE NEW ZEALAND APPLE INDUSTRY - A BRIEF PROFILE

New Zealand produces about 1 percent of the world's apples, and captures about 3 percent of the global fresh export apple trade. Receiving the lowest producer subsidy equivalents in the OECD, New Zealand's apple industry has responded effectively to increased risk and 'globalisation pressures, and it has been named as the World's Most Competitive Apple Exporter from 1996-2001[1].

Almost half of the national export crop is produced in Hawkes Bay and over one third is produced in the Nelson region (Figure 1).

Figure 1 Apple Growing Regions in New Zealand



The Hawkes Bay horticultural sector is the largest and most concentrated of any in New Zealand. Within this sector, fruit growing accounts for 60 percent of the total activity and apple growing dominates the regional fruit industry. Similarly, Nelson has a high degree of dependence on horticultural activity, where two out of every three jobs in that sector relates to fruit (mainly apple) growing (Business and Economic Research Ltd. 1997, 1998). The area of land planted in

[1] The World Apple Report is produced by an independent research organisation in the United States. The report has only been produced since 1996, and New Zealand has won each year. The rankings are calculated on 21 criteria organised into three main categories: (1) production efficiency; (2) industry infrastructure and inputs, and; (3) financial and market factors.

apples for Hawkes Bay and Nelson varies considerably. Hawkes Bay has about 7,000 hectares of apple orchards, while Nelson has about 4,000 hectares (Statistics New Zealand 199). The number of orchards varies year to year, with an overall trend towards larger orchards and fewer growers since the early 1990s. In 2000, there were approximately 750 growers in Hawkes Bay and 450 in Nelson.

In terms of regulatory and structural characteristics, the New Zealand Apple and Pear Marketing Board (NZAPMB) had statutory powers to control the sale of export apples as a 'single desk' seller from 1948 to 2000. During this time, the industry ran as a national grower co-operative and protected local grower control/ownership over, and input into, industry operations. More recently, the Board has traded under the name ENZA Ltd. (which also brands the apples). In 2000 the co-operative was corporatised and ownership shares in ENZA were issued that were tradeable among growers. Corporate growers have bought significant share interests from smaller growers which has changed the emphasis of the industry from smaller-scale grower control, to larger-scale fruit industry interests.

GREEN FACTIONS - MIXING POLITICS AND PRODUCTION PRACTICES

The contested shift from co-operative to company and from small-scale grower to 'corporatisation' provides some insight into the complex politics surrounding interrelationships between different 'green' factions of the industry. Aspects of these political issues are captured in discourses about the shifting and multi-scaled nature of global-local processes, including: deregulation debates within the industry; the emergence of 'green protectionism' in destination markets for New Zealand apples; and the rise of consumer concerns and the resultant importance given to quality and audit systems by destination markets.

DEREGULATION PRESSURES

Since 1998, ENZA has been under intense pressure to deregulate from proponents of 'free market' ideology. It is feared by many smaller scale growers that removal of the 'single seller' legislation and the ENZA's exclusive control over export products will have widespread negative economic and social impacts on major producing regions (YAF 1998a, 1998b; Business and Economic Research Ltd. 1997, 1998; Kearney 1998; McKenna, 1999a, 1999b). Located far from its main markets, capitalising on an 'exclusive' New Zealand brand (ENZA), and producing a small fraction of the world's apples - the single seller system is widely considered in the industry to maximise grower returns. While overseas evidence suggests that it would be likely that some growers and post-harvest operators would make more money in a multi-exporter system, the impact on the majority of growers, related service industries, dependent communities and net foreign exchange earnings is thought to be negative (YAF 1998a; Business and Economic Research Ltd. 1999). Within the apple industry, opinions vary over the deregulation debate and whether or not ENZA functions as efficiently as possible and in the best interests of growers.

The *New Zealand Apple and Pear Act* (1948) has been amended to the *Apple and Pear Industry Restructuring Act* (1999). The implications of the Restructuring Act have been politically complex and damaging to 'single desk' interests. From 1 April 2000, a new body called the 'Exports Permits Committee' has had the power to decide on independent export consents - separate from ENZA's control. The principle for 'private' export consents remains one of 'complementarity' - not conflicting with ENZA Ltd.'s global marketing plan, but in practice this has not been the case (McKenna and Roebuck 2000). In 2001, approximately 25 percent of the total export crop was sold outside of ENZA's control which led to weak selling of New Zealand apples in world markets. For the first time in more than 50 years, New Zealand interests competed amongst themselves, largely on price, as a means to secure market share (McKenna and Roebuck 2000).

Other important changes to industry structure and function involve the removal of compulsory acquisition of fruit by ENZA Ltd.; the deregulation of onshore logistics and; the point of fruit acquisition moving from coolstore to 'free alongside ship' (FAS). While the Board would have preferred to have maintained its cooperative structure in 1999 (New Zealand Apple and Pear Marketing Board 1999) the Government insisted that ENZA Ltd. operating under the Companies Act would: improve transparency and accountability; provide better price signals; allow capital withdrawal, and; clearly separate commercial and regulatory functions.

GREEN PROTECTIONISM

The pressures to deregulate the apple industry within New Zealand – and their uneven outcomes as mediated by the participation of multiple interested parties – have occurred at a time when the global trade conditions for apple exporting have been changing. A major factor in industry restructuring is the emergence of 'green protectionism' in destination markets.

Even before the completion of the GATT Uruguay Round in 1995, international border controls on the sanitary and phytosanitary (SPS) qualities of food imports were becoming tighter. Such controls do not appear to be entirely divorced from politics. SPS barriers now involve much lower Maximum Residue Levels, an increasing range of banned inputs, and clauses enabling embargoes on goods that might cause environmental damage or compromise animal welfare. Campbell and Coombes (1999), argue that SPS and/or 'food safety' barriers have become a major mechanism for protecting EU and Japanese farmers against a tide of cheap, intensively produced, imports from the US (see also Saunders 1999).

However, the process for establishing legitimacy for environmental claims has proved highly problematic. Within the Uruguay Round Agricultural Agreement (URAA), the principle was established that 'scientific proof' was required for

overriding free trade in favour of environmental protection. While that principle was agreed upon, the practice of establishing scientific consensus has proved very difficult in highly politicised trade situations. Two examples of this in 1999 alone were the widespread agreement of the US science establishment that Bovine Growth Hormone (BGH) had no adverse effects, while EU scientists contended that there were potential health and animal welfare risks from using this particular input. A second debate, and one that is receiving considerable attention in New Zealand's FFV industries, is emerging over the potential environmental and health risks posed by genetically modified foods.

The result of these conflicts around perceived potential risks is that it is unlikely that markets will quickly move towards more permissive SPS regimes and, in fact, it is more likely that some First World markets will become more restrictive. New Zealand's FFV exporters have identified these trends as threatening to long-term market access for conventionally produced FFV from New Zealand (Campbell and Coombes 1999).

By the early 1990s, the New Zealand apple industry had spread its international market access risk by developing markets in over 60 countries - compared to about 40 countries in the 1970s (ENZA 1998). Despite reaching so many markets, ENZA could not avoid the emergence of green protectionist strategies in some key markets. Australia for instance, has banned New Zealand apple imports since 1935 claiming the domestic industry would be threatened by bacterial infection through fireblight (Bacillus amylovorus Trev.). Exhaustive scientific evidence has shown the risk of infection through New Zealand fruit to be very low, however Australia has maintained its 'biological' ban. One of the reasons for the utility of green protectionist strategies for some First World governments, is that such a strategy combines a desire for protection from imports expressed by agricultural producers with the emergence of concern over food safety and a shift in consumption patterns by mainly urban consumers.

CHANGING CONSUMER/RETAIL DEMANDS

While the 1990s have been characterised by complex trade negotiations and the emergence of new global trading realities, there have also been significant shifts *within* destination markets. Two such shifts have involved the continued move by First World consumers towards 'fresh', 'healthy' or 'green' foods (Le Heron and Roche 1995; Goodman and Watts 1995; Campbell and Coombes 1999; McKenna et al. 1998), and the subsequent shift by large distributors such as supermarket chains and consumer co-operatives to position themselves as the preferred suppliers to this growing (elite) market. New Zealand's reputation for quality since early in the century has become one of the apple industry's most important strategic assets in the contemporary market.

Given the dual pressures of legislated/governmental requirements and retailer demands to meet perceived consumer preferences that together created a green protectionist barrier, the NZAPMB moved in 1996 to develop an Integrated Fruit Production (IFP) system. Such systems were recognised by European consumers in particular as providing 'safe' and 'environmentally grown' fruit (see subsequent sections for discussions of IFP), and would also satisfy rising SPS barriers at the point of entry into these markets. For ENZA, this transition marked a shift from commodity trading of intensively produced fruit to a re-imaging strategy which preserved market access and tied ENZA more closely to large retail chains (ENZA 1999).

First World supermarket chains are growing in size and developing extensive international linkages, while at the same time becoming more prescriptive in their fresh fruit requirements. Concentration of the retail sector is particularly pronounced in ENZA's main markets in the UK and the US which respectively take 30 percent and 25 percent of New Zealand's total crop by volume. The power of retail chains to influence 'environmentally safe' production practices was clearly signaled by UK supermarket Tesco in 1997, which claimed to be the largest single customer for New Zealand pipfruit. Tesco informed growers that not only were they poised to demand that produce be grown under IFP or similar schemes, but that they would not pay a premium for it. In effect they were demanding IFP practices as the minimum entry standard to gain access to their consumer base. The implications for growers are significant, and have an impact on options for varietal mix, production techniques, labour processes, management practices and acceptable trade-offs between economic and environmental sustainability.

While such processes are unfolding at the level of a single distribution chain like Tesco's, there are also initiatives between EU distribution chains to standardise and audit their environmental demands. Currently, this operates under the rubric of the Integrated Crop Management (ICM) protocols which are adhered to by 20 EU supermarket and co-operative chains (Howley 1997). At an even higher level of scale, the ISO14000 system for auditing Environmental Management Systems is increasingly being utilised by distribution channels to guarantee food safety (Saunders 1999). Each of these initiatives – at the supermarket, intra-supermarket, or supra-supermarket level – are contested and produced by the changing politics of food distribution. They do, however, have one common factor; all are heading towards tighter food safety and environmental auditing criteria.

In summary, the New Zealand apple industry's restructuring and 'greening' pressures have clearly global-local dynamics. Apple production is strongly inserted into regional economies and local/regional institutional, political and biophysical environments while simultaneously having distinctly 'global' connections and dependence on overseas markets. Deregulation pressures and 'free market' ideology have had significant impacts on shifting regulatory structures within the industry. At the same time, the nature of industry restructuring has been profoundly influenced by a 53-year history of grower co-operation at the national level. Overseas consumers and large-scale buyers of New Zealand apples

have demanded 'safer' production practices resulting in at least two significant global-local trends. First, growers are experiencing risk and competition on an ever expanding scale. 'Local' production systems and areas are constantly (re)articulating and re-scaling through connections with national and 'global' processes. And second, industry greening reflects complex glocal politics over regulation, economic efficiency, national 'sustainable' development legislation and consumer choice. The re-scaling of industry regulation and production practices reflects the dynamic and contestable nature of socio-spatial relations underlying agrifood commodity systems.

IFP and OFP Approaches to 'Safe' Practices

> Where do organics start and stop? You need dedicated plant and tools - picking buckets, ladders, hand tools, vehicles - to do it, but what about the other parts of the operation? Does organics represent *efficient* systems? Because right now you need a 30 metre buffer strip between conventional and organic production which is an inefficient use of land. ~ Grower Interview 1
>
> ENZA cannot advance my interests as an organic pipfruit grower. ~ Grower Interview 3

While the market pressures over 'safe food' were clearly evident in the mid-1990s, the style and extent to which New Zealand's FFV exporters responded to these pressures varied. Here the politics of scale became an important feature of the resultant configuration of 'green' production of apples.

At the national regulatory level, New Zealand policy makers sought to reconcile the evident necessity to address concerns about 'sustainability' in general (both at home and in the overseas marketplace), with the more specific political commitment to engage in any such activities with the minimum of governmental intervention or guidance. The result was a pursuit of 'sustainability' that was often contradictorily defined and pursued in a token way by different government agencies.

With respect to 'safe' practices in the apple industry, initial attempts to establish organic production were bypassed in favour of establishing an Integrated Fruit Production programme (IFP). The decision to favour IFP over organic apple production as the industry response to greening pressures had broad ramifications for the sector. A key reason given for this decision were the perceived risks associated with growing organic apples. Scientists within the industry, orchardists, independent consultants and even the organic certification body Bio-Gro agreed that growing apples organically was one of the most challenging systems to place under organic production.[2] In particular, the high number of insect pests occurring in apple production was considered by the industry to create the potential for large-scale crop failures under organic production. Consequently, this was a significant reason why IFP was strategically favoured over organic production by ENZA.[3] While these biophysical issues were germane to the development of ENZA's strategy towards industry greening, the following discussion will show how these biophysical issues in organic and IFP production became interwoven with the politics of scale and discourses about industry deregulation.

The industry decision to favour IFP was partly influenced by concerns over the biophysical viability of organic production, and partly because of clear opportunities for IFP in the market. Large-scale IFP growing systems were already established and recognised in European markets. The most definitive 'environmental' signal sent to ENZA by overseas buyers occurred in 1995-96 when a group of six UK retailers formed the Fresh Produce Consortium and specified that apples from New Zealand had to be produced using Integrated Pest Management systems (IPM). These retailers controlled more than 78 percent of all UK FFV sales. These 'global' market demands were, however, complicated by the contradictory regulatory trajectories of the EU and US, with the EU supporting a shift towards IFP-style production while US quarantine requirements increasingly targeted both low residues and a high level of guarantee that pests were not present on fruit (Batchelor, Walker, Manktelow, Park and Johnson 1997; Walker, Hodson, Wearing, Bradley, Shaw, Tomkins, Burnip, Stiefel and Batchelor 1997; Manktelow, Beresford, Hodson, Walker, Batchelor, Stiefel, and Horner 1997; Anon 1995).

Integrated Pest Management is the philosophical cornerstone of international IFP programmes and is defined as:

> The control of pests by employing all methods consistent with economic, ecological and toxicological requirements while giving priority to natural limiting factors and economic thresholds[4].

Developed in the 1960 and 1970s, IPM was extended in the 1980s to include disease control and other aspects of crop production. With support from the International Organisation for Biological Control (IOBC), IFP programmes for apple have been practiced in Europe since the late 1980s. By the early 1990s, apple producers in Italy, Austria, Germany, Switzerland and the US were involved in IFP practices (Solymar 1996). While each country's IFP programmes are

[2] One independent organic production consultant considered this to be an excellent reason why organic production should be attempted for apples: 'to demonstrate that organic production can be achieved for any crop in New Zealand'.
[3] McKenna and Campbell (1998) list some other reasons including: difficulties achieving export fruit quality standards, and concerns over the long-term status of some organic applications like copper sprays being permitted in the organic standards.
[4] From, *Present Status of Integrated Control of Pests,* in Mededelingen Faculteit Landbouwwetenschpen. 533: 245-265, 1974.

different (owing to specific pest and disease conditions) they all adhere to common principles and, particularly in Europe, reflect high levels of consumer concern over pesticide residues on fruit.

The balance between environmental and economic objectives inherent within IFP has important implications for ENZA's crop management strategies and international marketing objectives. ENZA's IFP greening strategy is predicated on the twin goals of ensuring economic benefit through establishing 'environmentally differentiated' fresh produce and guaranteeing maximum market performance by maintaining access to established and lucrative markets that were moving towards 'green protectionism' and more stringent food safety requirements. The adoption rates of IFP practices in New Zealand have been extremely rapid. From 88 test growers in 1997, all 1,500 New Zealand export growers produced fully IFP or IFP-Transitional fruit by 2000. These rates of adoption would not be possible without the comprehensive research and operational focus of the single desk structure governing the export apple industry in New Zealand.

However, implementing the IFP programme has been contested. The apple industry experienced an institutional split between IFP and OFP strategies linked to ENZA's initial decision to favour industry-wide IFP practices in the early-mid 1990s.[5] While a small amount of organic R & D was taking place, a major institutional split emerged between ENZA and independent exporting of organic fruit.

Throughout the mid to late-90s, the market opportunities for organic apple production in New Zealand were generating significant interest from growers. Market data shows that in 1997-98, conventionally grown apples returned approximately $10.00 tce[6], while organic apples returned about $30.00 tce (ENZA 1998; Stiefel and Lichtwark 1998). These figures should be interpreted with some caution, however, because they represent different sets of industry costs and charges associated with the NZAPMB's foreign exchange management in the 1998 - factors that prevent any direct comparison of market performance.

At the time of writing there was one 'large-scale' exporter of organic apples - Freshco - which is based in Auckland. Freshco shipped approximately 150,000 tce in 1997 and gained an export consent to ship 350,000 tce in 1998-99 (although there were difficulties in securing adequate supply). By 1999-2000, Freshco was exporting to 650,000 tce of organic or organic-transition apples overseas. However, considerable speculation exists over whether Freshco will be able to source and effectively market this many apples in the coming seasons. Given New Zealand's total export volume (in 1999-2000) of approximately 18 million tce, the 1999 export organic crop represents about 2 percent of the total exported apple crop. Freshco handles a range of FFV exports and has specifically targeted organic produce, with a third of its business in 1999 organically certified to some extent, and a declared aim of 100 percent certified as produced using environmentally sound growing practices within five years (*New Zealand Herald* 23.8.99).

Prior to 1996-97, there were few opportunities to pursue export marketing of organic pipfruit. The organic production that did occur was conducted by small-scale, organisationally-isolated growers with a strong commitment to the sustainable agriculture movement. Before Freshco's first organic apple export consent in 1996-97, organic apples were largely sold at the gate or distributed to New Zealand outlets specialising in organic produce, with a very little being entered into ENZA pools of conventionally grown fruit for export. At the time of writing, approximately 37 growers, mainly from Hawkes Bay, supply organic apples to Freshco.

Since claiming to have conducted a small, but successful, organics programme with fruit being targeted to key bio-outlets in Continental Europe and the UK in 1998, ENZA has recently developed a proposal to develop its own organic export programme (ENZA 1999a, 1999b). The principal challenge for ENZA's organic programme is identifying and securing a supply pool. However, in the 1999-2000 season, ENZA competed directly with Freshco for organic fruit having given a commitment to operate as a commission seller on behalf of organic growers and promising some technological production support to organic orchardists. ENZA's organic programme however, remains underdeveloped.

The different positioning of ENZA and Freshco over organics has led to some degree of political hostility between the organisations over a much wider terrain. Tensions focus on ENZA's statutory powers and issues surrounding 'industry greening'. As IFP practices become more 'mainstream', the position of Freshco's 'organic fruit' may be eroded in terms of market value. The fact that there has been only one exporter of organic apple in New Zealand to date, keeps the fruit prices and grower pay-outs higher than if competition ensued between two or more organic exporters in international markets - multiple exporters normally lead to weak selling practices and lower grower returns in the long term.

Interview data with organic growers in Hawkes Bay revealed complex and contradictory views about organic and IFP growing practices and related industry operations. In addition to the philosophical appeal of organic apple production, all of the growers cited disaffection with ENZA as a contributing factor to their decision to produce organic fruit. Most organic growers also advocated industry deregulation as they felt the export consent process under which Freshco markets their organic apples was prone to manipulation and inconsistency by the NZAPMB consents-granting committee before

[5] This does not imply however, a complete absence of organic-related research and development within the apple industry. HortResearch, a Crown Research Institute, has conducted experiments and field trials with organic apple since the late 1980s. HortResearch's station in Central Otago (at Clyde) produced small volumes of organic fruit that were exported under the ENZA brand in 1998-99.

[6] Tray Carton Equivalent, which equals 18.2 kg.

2000. In other words, combined sentiments of improved environmental stewardship and 'opting out' of ENZA's marketing control were key motivating factors for moving to organic production systems. Cast in terms of historical ideological resistance to the principle of co-operative fruit exporting, it could be argued that an important 'local' contributing factor to organic growers' participation in alternative exporting arrangements is based on contested regulatory politics as much as on environmental politics.[7]

Ironically, Freshco is attempting to maintain its 'monopoly' position in organic exporting - seeing the advantages of being a single seller - at the same time that it is challenging ENZA's overall political position as a statutory producer board. Should ENZA or any other exporter successfully start exporting organic pipfruit, initial returns to growers may rise due to competition for supply, but international evidence suggests that returns would decrease in the long term. Further, ENZA has made some steps - albeit slowly - towards 'capturing' a pool of organic growers. The new legislative structure, where export consents are given by a body independent of the Board has been proposed as a way to avoid such obvious conflicts of interest; however, only time will tell whether this is able to be achieved.

Given these overlapping tensions, co-operation between the various 'green' components of the industry is minimal or non-existent. Several scenarios might emerge from the current restructuring. First, organic production may continue to operate under export consents and represent (to some degree) a production and political space for growers who opt out of the conventional system based on some combination of environmental, economic and political choice. Second, the entire production and investment structure of organic apple production may fundamentally change as the existing suite of pest control strategies ceases to be permissible under organic certification. Third, ENZA may make some constructive and concerted steps to encourage and incorporate organic apple growing as an important (if small) component of its production and marketing operations. The advantages of this strategy for ENZA would be some potential economic gain (through developing and exploiting markets); and promoting industry innovation in research, production, investment and marketing. At the same time steps should be taken to include organic growers' viewpoints within the newly restructured apple industry.

CONCLUSIONS - IT'S NOT EASY BEING GREEN

The New Zealand apple industry has embarked on a greening strategy that highlights a number of broader theoretical issues about the way in which we conceptualise the restructuring of agri-food systems.

Owing to the unique conjuncture of both greening strategies and the politics of deregulation the apple industry is an excellent example of how biophysical conditions in production, shifting regulatory frameworks and political contestation shape industry development prospects with respect to producing 'safe' foods. The move towards organic apple production has become intimately tied to resistance to a single-desk selling structure for the industry. Furthermore, within the apple industry, 'green' and 'fresh' discourses are characterised by parallel and simultaneous movements to smaller and larger scales, contributing to complex transformative politics and power struggles within industry regulatory structures and production systems. This is most clearly demonstrated as the broad and unified structures of the industry endorse and develop the IFP-based version of greening, while a small-scale, isolated and sometimes forthrightly rebellious group of producers have collected under the organic cause to supply one independent export company.

To date, there has been a separation of activities between private export of organic fruit and producer board export of IFP fruit, and with similar separation for support systems. However, this separation is not particularly synergistic, and at the current point in time ENZA is initiating competition for organic supply. While ENZA's statutory powers allow some planning as to where export licenses are granted, there is an overall atmosphere of suspicion between the various parties involved in industry greening strategies. ENZA's future success in securing organic supply post-deregulation, remains a matter of speculation.

Our research has shown that growers' choice to engage in organic or IFP production stems from a complex mix of environmental and economic philosophy, personal financial position, views on industry politics and structure, biophysical constraints of land holdings and the willingness to pursue 'unconventional' socio-cultural production techniques. Contemporary industry greening practices and choices therefore, are constantly shifting and re-scaling according to different mixes of macro- and micro-scale risk factors and opportunities. In turn, the glocalised politics of scale are shaping the terms of industry participation, political contestation of regulatory structures and orcharding practices.

This research into New Zealand's apple industry has provided an opportunity to examine broader theoretical issues in our understanding of agri-food systems – primarily through a theoretical re-examination of 'scale'. Re-thinking what 'scale' represents in the material and metaphorical sense is a vital, and as yet relatively under-explored step, in negotiating a way through the oppositional 'global-local' dialect currently shaping theoretical debates in agri-food research. The theoretical focus on discrete 'scales of activity' - and the implicit assumption that scales have ontological meaning and content - has obstructed progress on thinking about the ways bio-politics, regulation and social processes of food production are (re)produced in different places and industries. Revisiting 'scale' as something that is socially-based,

[7] This contrasts strongly with the neighbouring kiwifruit industry. Campbell et al. (1997) found no similar mixture of enthusiasm for industry deregulation and production under organic systems. Clearly, there are significant localised differences in the politics of industry deregulation between the apple industry in one region of New Zealand and the kiwifruit industry in another.

contested and produced allows us to think about food production, consumption and regulation as embodying spatial and temporal compromise between power relationships and existing forms of co-operation. This is particularly important as agri-food theory grapples with how to re-introduce the bio-physical into agri-food systems. This examination of the New Zealand apple industry has shown how the influence of biophysical aspects of organic and IFP systems became central to a re-scaling of political alliances within the industry. As growers made their choices about pest control strategies, the daily deployment of pheromone traps and other pest control strategies became deeply significant actions in the unfolding of both the politics of industry deregulation and the articulation of New Zealand apple exports with international trade pressures, green protectionism and health conscious consumers.

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