

STRATEGIES FOR INCREASING FARMER INPUT AND CONTROL OF FOOD
LABELING INITIATIVES IN MICHIGAN AND THE UNITED STATES

By

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ABSTRACT

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Quality labels are one type of marketing strategy employed in efforts to renew small and mid-size farming. The declining number of farms in the United States has raised concerns about the negative impacts of these trends on rural communities, such as population loss and a weakening social fabric. Quality labels are voluntary seals or logos that distinguish food credence attributes, such as geographic origin and/or a particular production method, or environmental, social, and/or animal welfare criteria. The benefits of participating in these labeling initiatives for farmers may include market niches and price premiums.

Some of the most successful labels are becoming less effective for contributing to small- and medium-scale farm economic viability, however, despite growing consumer support and market share. Organic and fair trade labels have attracted new and larger entrants, which contributed to declining price premiums. These changes have also resulted in less farmer input with respect to certification and changes to standards, facilitating the participation of larger-scale operations. Could greater farmer input and control over labeling initiatives in the US increase their contributions to small- and medium-scale farm economic viability, and if so, how?

To begin to answer this question, I examined farmer interest in one particular practice that has strong potential for inclusion in a quality label: the installation nest boxes for American Kestrels, a predator of smaller birds, including those that eat fruit crops. The first study analyzed Michigan blueberry and cherry farmer's mental models to understand how they relate to the adoption of nest boxes. Farmers who used more biological factors in their mental models for pest

management were more likely to adopt this conservation practice. The use of mental models in outreach may improve understanding the relationships between biological factors in farming systems, which could potentially increase the adoption of conservation practices. The second study was an online survey of cherry and blueberry farmers in the United States, to assess perspectives of nest boxes as a pest management strategy for their farm, and as an industry marketing strategy. The majority of respondents indicated a high degree interest in both. Most farmers also shared the perception that natural predators lower pest pressure and bird damage, and help to raise fruit quality and income.

The third study involved interviews and a comparative legal analysis of France's Organismes de Défense et de Gestion (ODGs). ODGs are self-governing nonprofit associations that focus on the development of production standards, and management and promotion of the related quality label or brand. The ODG model is structured in a manner that can be compliant with US anti-trust laws, and the core purposes can easily be replicated in Michigan and other states. Its high degree of farmer input may have greater potential to resist weakening of standards and lowering of price premiums, in comparison to other labeling approaches. The ODG model could potentially be employed to label the use of nest boxes and other conservation practices for sweet cherries in the Michigan, for example, via the creation of a non-profit organization, which trademarks a logo to represent its farmer-member developed standards. More research is needed to determine the feasibility of labeling initiatives and their potential contributions to farm viability, however, in particular the food items and attributes that are most desirable to consumers.

This dissertation is dedicated to my supportive family, Michigan State University, and Dr. David Schweikhardt.

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CHAPTER 1. *Introduction*

In recent decades, “quality” labels have garnered increasing interest for their potential to contribute to the economic viability of small- and medium-scale farms (Bacon, 2005; Cei et al., 2018; Qiao et al., 2015; Reganold & Wachter, 2016; Vandecandelaere et al., 2020). Growing numbers of voluntary labels have been developed to communicate food quality attributes, typically with a product seal or logo—these characteristics may be unobservable to consumers, but distinguish such products from commodities. To the extent that these credence attributes are recognized and sought by consumers (Aprile et al., 2012; De Canio & Martinelli, 2021), benefits of participating in these labeling initiatives may accrue to farmers through the development of market niches and price premiums (Qiao et al., 2015; Vandecandelaere et al., 2020). Some of the most rapidly growing quality labels signify a geographic origin and/or a particular production method, or signify the embodiment of particular values, such as environmental, social, and/or animal welfare criteria. Efforts to communicate such criteria to consumers are frequently grouped under the umbrella term “ecolabels” (Iraldo et al., 2020)

Origin- or geographic-based labels (GIs) originated in France to link particular foods to specific regions—some of the most well-known such products include Roquefort cheese and Champagne sparkling wine (Barham, 2003; Bowen & De Master, 2011; Owen et al., 2020). Market successes with GIs have led to their proliferation globally, but especially in the European Union and Japan—these governments have enacted policies that provide more support for value-added agriculture labeling as an economic development strategy (Belletti et al., 2017; De Master et al., 2019; Duvaléix et al., 2020; Gugerell et al., 2017; Kimura & Rigolot, 2021; Zago & Pick, 2004).

The benefits of GIs for economic development may vary substantially, however. In some contexts, especially in less industrialized countries, they have been criticized for providing smallholding farmers very little of the added value of their label (Bowen, 2015; Hughes, 2016). However, GI proponents suggest that this type of outcome occurs in circumstances where there is a lack of government institutional support for development and oversight (Biénabe & Marie-Vivian, 2017; Bowen & Zapata, 2009; Chabrol et al., 2017). Concerns have also been expressed about the potential for the expansion and use of GI labels by farmers, particularly in Europe, to dilute their current strength in the marketplace (M. Nozières-Petit, personal communication, 2019).

One of the first food ecolabels was fair trade, which sought to increase the prices paid to farmers in developing country contexts. The model was developed for handicrafts beginning in the 1940s, but was applied to coffee beginning in the late 1980s. This initiative has achieved notable successes in improving farmer incomes, welfare and livelihoods (Bacon, 2005; Ruben et al., 2009; Jaffee, 2014). Fair trade labels may also vary in their level of effectiveness for farmers, however. The entry of larger-scale companies into fair trade coffee schemes has placed downward pressure on sustainability standards, such as key certifiers allowing plantation-based production to be certified as fair trade, a trend that potentially dilutes the labels' credence in the eyes of consumers (Howard & Jaffee, 2013; Jaffee & Howard, 2016). Although the fair trade label was originally not applicable to US farmers, several organizations are piloting efforts to shift from export-oriented to domestic contexts with a small number of farms (Romeo, 2017).

The most commercially successful ecolabel is organic, which accounted for 5.8 percent of total food sales in the US in 2019 (Wunsch, 2019). Its criteria include the prohibition of synthetic fertilizers and pesticides, as well as animal welfare requirements. Although organic has origins as a farmer movement, it has transformed significantly as a result of its market success (Guthman,

2014; Obach, 2015). Organic food production and its popularity with consumers in the United States grew enormously with the creation of the USDA National Organic Program, beginning from 2001 to 2002 (Heckman, 2006). This certification has provided substantial markets for farmers that comply with the rules (Allen & Kovach, 2000; Reganold & Wachter, 2016; Willer & Lernoud, 2019) and has demonstrated the potential to increase the profitability of farms, especially on a per acre basis (McBride et al., 2015; Langemeier & Fang, 2020). Other food ecolabels include those that address animal welfare criteria (Powers et al., 2020), or predator-friendly criteria (Bogezi et al., 2019), although many of these initiatives have enrolled relatively few participants in comparison to the more than 14,000 certified organic farms in the US (USDA NASS, 2017).

While the motivations behind quality and ecolabelling initiatives are diverse, many implicitly or explicitly seek to improve the economic viability of small- and medium-scale farmers. As the average scale of farming has increased in many parts of the world, the number of farms has declined—in the United States, for instance, approximately 69 percent of agricultural sales are made by less than 80,000 farms (USDA NASS, 2019). Farm consolidation in recent decades has affected commodity crop and livestock production—the midpoint for milk cow herds increased from 80 in 1987 to 1,300 in 2017, for example—but these trends have also affected fruit, vegetable and nut production (MacDonald, 2020). Midsize operations have been exiting farming at the highest rate, which raises concerns about the negative impacts of these trends on rural communities, such as population loss and a weakening social fabric (Lobao & Stofferahn, 2008). Such farms also tend to be more agriculturally diverse and more flexible than larger operations (Kirschenmann et al., 2008), and may show more resilience to disruptions, such as diseases and natural disasters (Hendrickson, 2015; Hendrickson, 2020). Quality labels are just one type of innovative marketing strategy that attempts to renew small and mid-size farming, along with

potentially overlapping initiatives such as food hubs, farmer and consumer cooperatives, and farm to institution programs (Lyson et al., 2008).

The value of existing labelling schemes for farmers, particularly the organic label, may be eroding, however. A growing number of farmers who use organic practices are not pursuing organic certification, due to costs and paperwork requirements, especially for those who sell primarily in direct markets and are already trusted by their customers (Constance et al., 2008; Veldstra et al., 2014). In addition, as organic sales have increased, this market has attracted larger-scale producers, and contributed to shifts in the composition of the National Organic Standards Board (NOSB) (Dentzman & Goldberger, 2020; Jaffee and Howard, 2010). This “commodification” of organic (Conner, 2004) has also contributed to declining price premiums, as well as controversies over standards, such the allowance of non-organic ingredients in processed organic foods. Initiatives to develop new ecolabels by adding dimensions of sustainability missing from the USDA organic label (Howard & Allen, 2006) have resulted, particularly due to NOSB decisions in 2017 to allow hydroponic production practices, and to withdraw stricter proposed requirements for livestock access to pasture. Regenerative Organic Certified and The Real Organic Project are two recent label initiatives that take USDA standards as a baseline, but prohibit hydroponics and confined animal feeding operations—they both also include the participation of former NOSB members (Howard, 2021). The Real Organic Project website, for example, states, “Industrial powers are changing the definition of USDA organic,” and their recent newsletter provides this farmer member quote: “The same thing is happening in the organic market that's happened in the conventional market where all the family scale farms are being forced out of business by all of these large corporate entities”. (Real Organic Project, 2021).

In light of this, the question arises as to whether greater farmer input and control over labeling initiatives could increase their contributions to farm economic viability. This is a difficult question to fully answer, due in part to the challenges of evaluating the development of numerous quality label initiatives, particularly for funding and conducting longitudinal studies of these efforts. While GIs are considered to be a form of bottom-up development (Gangjee, 2017), for instance, the specific question of whether GIs having greater farmer involvement have better outcomes than downstream-lead GI initiatives has received much less attention.

Loconto and Busch (2010) posit that formal standards generally create power for those able to be substantially involved with the rule development process. GIs, for example, are generally governed by their participants, who include farmers and processors, even in contexts where there is significant government support. This self-governance, along with the fact that the intellectual property resulting from the development of production rules is owned by the GI group, may make them more resistant to industry cooptation than organic programs (Busch, 2018). However, this hypothesis has not received much empirical study, and many questions remain, such as how the advantages of GIs could be applied to other types of quality labels, or applied to contexts where they are less commonly utilized.

More specifically, could greater farmer input and control over labeling initiatives in the US increase their contributions to farm economic viability, and if so, how? To begin to answer these questions I (1) explored how Michigan farmers think about a production practice that could potentially be incorporated into a quality label, (2) assessed national farmer interest in adopting this practice, and (3) analyzed which aspects of quality labeling initiatives in France—which have a high degree of farmer input—could be applied in the legal context of the United States.

For the first two studies, I looked closely at one particular farming practice that has strong potential for inclusion in an ecolabel: the installation nest boxes for American Kestrels. Kestrels are a predator of smaller, fruit-eating birds that often cause significant damage to crops, including blueberries, cherries, grapes and apples (Anderson et al., 2013; Shave & Lindell, 2017). Installing nest boxes in or near fruit production areas encourages kestrels to live and hunt in those areas during nesting season. The presence of kestrels has been found to decrease the number of fruit-eating birds nearby by scaring them away, and this in turn reduces bird damage (Shave et al., 2018).

Other important attributes of nest boxes identified by Shave et al. (2018) include:

- contribute to the conservation goal of increasing the populations of American Kestrels
- inexpensive, with a relatively low initial cost (approximately \$100) and labor requirements
- reasonably simple to build, install, and maintain, and the work can occur outside of the busier times of the farming season

In addition, research suggests there is substantial consumer interest in nest boxes, and a willingness to pay small premiums for fruit produced using this practice (Herrnstadt et al., 2016; Oh et al., 2015).

The blueberry and cherry industries have key attributes that contributed to a research focus on these specific fruits. Within these industries a substantial number of growers have some experience with nest boxes, and there is a high degree of awareness of the practice even among those who lack such experience. Information about the efficacy of kestrel nest boxes in Michigan has also been recently shared by university extension personal and industry partners to further increase awareness among these farmers. Another factor in selecting these industries for this study is that I am familiar with fruit production practices, having worked in and/or managed cherry

acreage for more than 25 years. As a result, I have extensive contacts with growers, researchers, and other actors in the Michigan cherry industry. Furthermore, blueberry production and cherry production have many similarities, such as climate requirements and typical management practices.

In Chapter 2, *Farmer mental models of biological pest control: Associations with adoption of conservation practices in blueberry and cherry orchards*, I analyzed Michigan blueberry and cherry farmer's mental models to understand how they relate to the adoption of conservation practices. In order for a practice to feasibly be included in production rules for a quality label, it is important to understand the factors that affect whether farmers will adopt that practice. It is also important to ascertain any significant barriers to adoption. The research questions guiding this chapter were:

- What are the general characteristics of farmers' mental models for pest management decision-making and how do these relate to conservation practices and behaviors?
- Are conservation practices more likely to be adopted by farmers who include biological control factors in these mental models?

A key finding was that farmers who used more biological factors in their mental models for pest management were more likely to adopt conservation practices. Another finding was that using the method of mental models to depict management factors aided farmer understanding of how biological factors fit into the system. The use of mental models for educational purposes may therefore have the potential to help increase adoption of practices that utilize ecosystem services.

Chapter 3, *A bird's eye view: Fruit grower interest in adoption of nest boxes*, assesses national farmer interest in nest boxes as a pest management strategy, as well as a marketing

strategy. The following research questions were explored with an online survey of cherry and blueberry farmers:

- What are fruit growers' perceptions of how natural predators affect their production systems?
- What is the level of interest fruit farmers have in adopting the nest box practice to encourage the presence of natural predators (kestrels) on their farms?

A key finding was that a majority of farmers had a high level of interest in adopting the nest box practice, both on their individual farms, as well as part of a larger industry labeling effort. Strong agreement between farmers about how factors in their production systems interact was also found, and most farmers shared the perception that natural predators have the effect of lowering pest pressure and bird damage and helping to raise fruit quality and income.

To explore the organizational aspects of farmer-centric quality label development more broadly, I studied Organismes de Défense et de Gestion (ODGs). ODGs are the collective management bodies used in France by producers using one of the French quality labels, including GIs. ODGs provide an ideal model for study because their purpose or *raison d'être* is the development of production rules for agri-food products, and the management of the label/intellectual property associated with those rules. Additionally, ODGs provide a model having a high level of government institutional support, and a directive to ensure adequate farmer voice and balanced decisionmaking with respect to other industry actors participating in these organizations.

In Chapter 4, *France's Organisme de Défense et de Gestion: A model for farmer collective action through standard development and brand management*, I ask the questions:

- How are ODGs organized to develop production rules and to protect and promote the resulting quality sign brand?
- Can this mode of organization be replicated in the United States?

Legal research on French statutes, regulation, and programming related to ODGs was conducted in order to develop a clear description of how ODGs fit into the corporate, contract, commercial, and competition (anti-trust) frameworks of French law. Legal comparative analysis techniques were used to compare aspects of French law to that of the United States and to develop guidance and practice for organizing various aspects of an ODG-type organization in Michigan. Qualitative interviews were conducted with farmers, related industry actors, government and farmer outreach agents, and several other key informants.

I found that ODG's focus on standards development, and the defense and promotion of resulting intellectual property, makes this mode a unique mix of non-commercial activities and ownership and control of a brand. The ODG mode is structured in a manner that can be compliant with US anti-trust laws, and the core purposes can easily be replicated in Michigan and other states. Certain particularities of French law indeed mandate a high degree of farmer input to balance with the voices other food system actors, at least in theory, if not in practice. These aspects could be voluntarily adopted, or could potentially be imposed by an overarching privately organized umbrella label.

Chapter 5 concludes the dissertation by summarizing how these three studies contribute to our understanding of the potential for agri-food labeling initiatives to improve the economic viability of small- and medium-scale farms. I discuss the hypothetical application of the ODG mode to a quality label for Michigan fruits that includes conservation practices such as nest boxes. I suggest that the likelihood of success would be greater if farmers have sufficient organizational

involvement, a high level of understanding of how potential production rules will work within their farming systems, and well-informed decisions for which practices need to be included or excluded in the quality label rules. Furthermore, sufficient farmer voice, decisionmaking power, and self-governance could potentially protect against an erosion of quality or the greenwashing of standards by outside interests. This could enable and help ensure long-term reputational development and retention of price premia, in turn increasing the stability of farmers' income and the viability of their operations. Limitations to this research are also discussed, along with suggestions for future research to further clarify the potential for labeling initiatives to contribute to farm viability.

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CHAPTER 2. *Farmer mental models of biological pest control: Associations with adoption of conservation practices in blueberry and cherry orchards.*^{1,2,3}

ABSTRACT

Conservation practices in agriculture—such as biological pest control, provision of pollinator habitat and cover cropping—may provide ecosystem services that are beneficial to both farmers and wildlife. Despite these benefits, however, their use is not yet widespread and the factors that may limit adoption are not well-understood. In this study we tested potential associations between farmers’ beliefs about ecosystem services and their management practices using data collected from questionnaires and cognitive maps from 31 Michigan blueberry and cherry farmers describing their farming systems. We found that farmers who included key biological pest control concepts in their mental model representations reported the use of more conservation practices, and/or participation in conservation programs, than those who did not. In addition, the timing of management practices was a more central factor in the mental models of farmers who included both natural predators and beneficial insects than those omitting these factors. Finally, the farmers who included those two factors showed higher degrees of systems thinking based on mental model metric analysis. We suggest that outreach emphasizing the relationships between ecosystem

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³ The datasets generated and analyzed for this study can be found in the openICPSR repository at <http://doi.org/10.3886/E112171V2>, with the exception of the semi-structured interview data, which can be made available upon request.

services and the factors farmers view as most important may positively influence communication and potential of adoption of conservation practices and preventative pest management strategies.

INTRODUCTION

Farmers are in a unique position to foster the conservation of natural resources and cultivate ecosystem services because their decisions and behaviors have a direct impact on the environment. For example, certain agricultural practices can positively influence crop production while also providing societal or ecosystem benefits such as preservation of wildlife and improved water quality (Swinton et al., 2007; Lindell et al., 2018). Such “ecosystem services” that benefit crop production include biological management of pests, increased pollination, and soil health through development of biota (Power, 2010; Park et al., 2018). On the other hand, failing to adopt such practices or engaging in certain practices that may have negative environmental influences and can have an impact on ecosystem services such as wildlife habitat (Foley et al., 2011). In order to expand the use of conservation practices for agricultural pest management, educational outreach is needed to increase farmer awareness of the ecosystem services benefits associated with specific practices (Kross et al., 2017; Salliou and Barnaud, 2017; Penvern et al., 2019). However, research into the factors affecting farmers’ adoption of ecologically-beneficial practices is also critical (Halbrendt et al., 2014). Several studies have found associations between more “complex” thinking about ecosystems and the use of conservation practices (Vuillot et al., 2016; Teixeira et al., 2018) but understanding of how ways of thinking, behavior, and environmental outcomes are interrelated remains less characterized.

Farmers’ decisions on whether or not to adopt a particular practice can be based on a variety of interests, some of which may conflict with each other. Personal goals and motivations for

becoming a farmer can influence decision-making, creating barriers to certain practices but conduciveness toward adoption of others; for example, people who farm as a lifestyle choice might be more motivated toward conservation practices (Pannell et al., 2006; Greiner and Gregg, 2011; Prokopy et al., 2019). Like decision-makers in other natural resource management contexts (Stier et al., 2017), farmers might depend on university and industry experts when determining whether to take on a new practice or whether to continue with behaviors that are perceived to be working or otherwise beneficial. However, a barrier to adoption could potentially exist when knowledge about ecosystem services is not incorporated into a farmer's own thinking (Wyckhuys and O'Neil, 2007). This type of barrier has the potential to be overcome using appropriate information sharing techniques (Gray et al., 2014; Wilke and Morton, 2015) and, we propose, through incorporating ecological factors into their beliefs about farming dynamics.

A “systems thinking” approach to natural resource management considers, in a holistic manner, the way that important factors within a system interact with each other (Bosch et al., 2007). Instead of reducing a system to its parts, a systems approach examines how those parts fit into the whole (Gray et al., 2019). In a farming system, these “parts” include not only plants, soil, and farm inputs, but also soil biota, wildlife, water resources and runoff, and the farmers themselves. However, the degree to which farmers are engaging in ecological systems thinking, and how this influences their decision-making and on-farm behaviors, requires more research.

Knowledge about these farming systems, how factors are defined and the relationships between them can be developed through exploration of mental models, which are frameworks for thought that people use to understand their world (Jones et al., 2011). Mental models are used for making day-to-day decisions and are constructed through the acquisition of knowledge and through experience (Carley and Palmquist, 1992; Jones et al., 2011; Moon et al., 2019). For

farmers, one manner in which this knowledge can be developed over time is through social learning processes (Reed et al., 2010), where information is shared back and forth with university extension agents, scientists, and other industry partners at meetings, outreach events, and informal situations such as farmer-to- farmer communications that influence their decision-making and preferences (Li et al., 2016).

Social learning processes may be a key to sustainability for natural resource management, by enabling the sharing of multiple stakeholder perspectives over a long term (Muro and Jeffrey, 2008). An iterative process where decisions are made, systems are affected, and mental models are consciously modified to reflect the new resulting perception of reality could assist in the development of more sustainable systems (Hjorth and Bagheri, 2006). For agriculture, when farmers have knowledge of how a particular conservation practice or its sub-parts fit into a farming system, it should be reflected in their mental models. External representations of the assumptions of these models could enable them to make more informed decisions about how their farming decisions potentially influence social or environmental outcomes. While recent research has discovered variations in farmers' mental models based on their style of management (Vuillot et al., 2016), less is known about the association between the presence and absence of ecological information on mental models, and the degree to which different mental models affect management practices.

To better understand how farmers think about their farming systems, and if differences in mental models are associated with the adoption of these types of conservation practices, we focused on the following questions:

- What are the general characteristics of farmers' mental models for pest management decision-making and how do these relate to conservation practices and behaviors?

- Are conservation practices more likely to be adopted by farmers who include biological control factors in these mental models?

In order to study these questions, we researched blueberry and cherry farmers' mental models related to pest management, including how farmers perceive natural predators to work within their pest management systems. We paid special attention to the practice of installing nest boxes to attract American kestrels (*Falco sparverius*), a natural predator of fruit eating birds, because nest box installation is a well-known management method used by a substantial number of blueberry and cherry growers in Michigan. Bird damage is a significant problem for fruit farmers (Anderson et al., 2013), and kestrels can help manage bird damage in blueberry and cherry orchards. Kestrels have been found to be effective at keeping fruit eating birds out of orchards when they are nesting in close proximity, thereby decreasing damage to cherries (Shave et al., 2018). Nest box installation has been found to be both inexpensive and effective for encouraging nesting near cherry orchards in Michigan, and their use could help to conserve and increase area populations of kestrels, particularly where natural nesting is limited (Shave and Lindell, 2017; Shave et al., 2018). For these reasons nest boxes are an ideal focus for studying the adoption of conservation practices within pest management programs.

MATERIALS AND METHODS

Working with university extension and industry partners, we used purposeful sampling methods (Patton, 2015) to identify Michigan blueberry and cherry farmers across a variety of categories, including age, generational experience, marketing strategies, and farm size. As perennial fruit crop farmers, blueberry and cherry farmers utilize similar pest management strategies. During in-person interviews averaging approximately 1h for each farm, we worked with

farmers to create maps of their mental models of interactions between factors in their farming systems. We also administered questionnaires inquiring about their farm characteristics and adoption of sustainable agricultural practices. The mental model and questionnaire data were combined in order to better understand potential relationships between ecological systems thinking and the adoption of conservation practices, and to test the hypotheses that conservation practice adoption will be associated with mental models that incorporate ecological concepts. We conducted interviews covering a total of 34 farms (usually with one individual representing the farm but in several cases there were two). This yielded 31 valid data sets (the first was not usable because of subsequent changes in the interview procedure, and two interviewees did not fill out the questionnaire). More specifics about data gathering and analysis follow below.

Fuzzy Cognitive Mapping

FCM is a semi-quantitative method used to create an illustration or representation of a person's mental model about a particular topic or phenomena (Ozesmi and Ozesmi, 2004). FCM is increasingly used to aid natural resource management efforts (Hobbs et al., 2002; Meliadou et al., 2012; Vassilides and Jensen, 2016; Van der Sluis et al., 2018) and has also been applied to farming systems management and agricultural policy development (Fairweather, 2010; Christen et al., 2015; Pacilly et al., 2016). FCM is a useful tool for understanding the potential relationships between ecological thinking and adoption of conservation practices (Vermue, 2017); the mapping process may illustrate specific factors involved in farm production, and the relationships a farmer conceptualizes between those factors (Teixeira et al., 2018). Hence, the inclusion or omission of biological control factors, and the degree to which those factors are perceived to influence other aspects of the system, may provide insight into the degree of ecological systems thinking that a farmer employs.

The FCM mapping process consists of identifying factors or variables of importance in a system and then visually representing the connections between those factors, using a chalkboard, sticky notes, or other interactive and visual methods (Devisscher et al., 2016). The connections between factors on the map are typically given a direction (does A causally influence B, B causally influence A, or both), and a number between -1 and 1 is provided to signify the strength of the relationship between factors and whether it is positive or negative (van Vliet et al., 2010). The resulting map illustrates perceptions of the important factors in the system, and their direct and indirect relationships to each other. Importantly, most studies report a rapidly diminishing number of additional factors after conducting just five to ten interviews, due to a large number of shared concepts (Ozesmi and Ozesmi, 2004).

As graphical and “fuzzy” numerical representations of people’s mental models, FCM structural elements may be compared among farmers and quantitatively analyzed. Structural characteristics such as the number of factors, number of connections between them, and the density of connections can be calculated and combined with other data sets for further analysis (Ozesmi and Ozesmi, 2004; Misthos et al., 2017; Konti and Damigos, 2018). Analysis can also examine “driving” or “transmitting” concepts—those that affect other concepts or factors in the map but are not themselves affected by other factors (e.g., in the case of farming “weather” would generally be considered a driver). “Receiving” concepts are those that are affected by, but do not affect, other concepts in the map. “Ordinary” concepts are those that both affect and are affected by other factors (Christen et al., 2015; Teixeira et al., 2018). We posit that including more ordinary concepts therefore suggests a mental model that represents a higher degree of systems thinking because a systems approach considers interactions between various types of factors (human, mineral,

biological) at various scales (pest level scale, farm scale, larger ecosystem scale) (Bosch et al., 2007).

For this study, pre-interviews were conducted with two cherry farmers and one blueberry farmer in order to identify the key factors associated with pest management. Factors mentioned ranged from chemical methods of management to natural methods (including natural predators and beneficial insects), mammal, insect pests, and bird pests, weather, and markets. After testing and revisions, a total of 19 factors were identified and chosen for presentation to farmers during the mapping process. The concept “natural predators” is considered broadly to include insect natural enemies, predators of fruit eating birds, and predators of mice, among other agricultural pests. Because some beneficial insects are natural predators, there is some overlap between these concepts. Including these concepts in the mapping enabled us to understand how conservation practices fit into farmers’ larger pest management mental models in a broad sense, which then provides a framework for understanding how a specific practice such as nest box installation is considered.

These factors were written on squares of magnetic paper and placed on a 2’ by 3’ magnetic dry erase board. Using a technique employed by Christen et al. (2015) and Li et al. (2016), participants were invited to add any more factors that they felt were important aspects of the system. In our case, they were offered blank magnetic paper squares that they could write on and place on the map. Farmers were then asked to evaluate whether relationships existed between each of the factors, and to draw those relationships using lines (**Figure 1**), noting the direction and the positivity or negativity of the relationship (“If A increases, does B increase as a result [positive] or decrease as a result [negative]?”). After the interviews, the individual farmers’ FCMs were entered into Mental Modeler (mentalmodeler.org), a software program that allows the maps to be

visualized in digital form; the program was also used to analyze the FCM data for structural metrics (Gray et al., 2013).

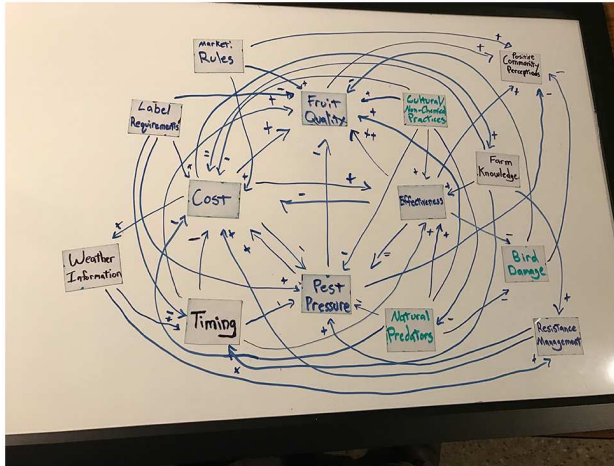


Figure 1. Example of a cherry grower’s mental map on the dry erase board. Arrows represent the causal direction (does A affect B or B affect A). “+” indicates a positive relationship (when A increases, so does B) and “-” indicates an inverse relationship (when A increases, B decreases.) A “++” or “--” indicates a very strong effect.

Questionnaire and semi-structured interviews

Our questionnaire was designed to elicit demographic information and farm characteristics, as well as to determine what types of conservation practices farmers have used, including installation of nest boxes to host natural predators. While this overall study was designed to better understand conservation practice adoption and ecological thinking broadly, the practice of installing nest boxes provides a well-known and promoted practice to use as an example. Therefore, we used the questionnaire to also inquire about different methods of bird damage control that farmers have used. Likert-type scale questions (Croasmun and Ostrom, 2011) assessed farmers’ perceptions of the effectiveness of those methods [scale from 1 (not effective) to 5 (very effective)]. Farmers also were asked about their participation in three specific state and federal environmental and conservation programs. An early draft of the questionnaire was tested during

pre-interviews, and the final version was administered during the in-person interviews to help ensure completion and to allow for any clarification questions.

Three semi-structured interview questions were asked after the mapping process and questionnaire administration to capture additional relevant information from respondents (Reed et al., 2009). Two of the questions focused on the FCM process to gain feedback on the method, and to inquire if anything important pest management issues or interactions were missed due to the nature of the FCM method. The third asked whether the farm's pest management was affected by the proximity of neighboring fields or crops. The resulting in-depth data was analyzed for recurring themes and concepts in order to discover any potential data gaps. We focused on concepts/codes related to the timing of pest management actions, site issues such as the effect of woods and adjacent farmland (for example if abandoned blocks caused pest pressure increases,) items not captured by FCM and improvements that could be made to the research and mapping process.

Adoption of Sustainable Practices index

An index variable for adoption of sustainable practices was constructed by adding the self-reported use of 14 conservation- oriented practices (Cronbach's Alpha = 0.831). Here "adoption" is considered to be the farmer reported use of a practices with an intent to have beneficial environmental, conservation, and/or ecosystem service outcomes. The practices included the following: the use of wildflower strips to increase levels of food available for pollinators, cultivation or protection of beneficial insects, the maintenance of cover crops or other habitat for beneficial insects, scouting for beneficial insects during regular field inspections for pests, mowing orchard floors to manage rodents and arthropod pests, the use of Integrated Pest Management principles, and the use of hedgerows to reduce spray drift. The index was scored by giving one point for each practice that a farmer self-reported using. The index also included any reported

participation in the following programs: the Conservation Stewardship Program (CSP), the Environmental Quality Incentives Program (EQIP), and/or the Michigan Agricultural Environmental Assurance Program (MAEAP). Each of these require the use of conservation and environmental quality-oriented practices (although we simply gave one point for participating in each program; we did not characterize specific practices within these programs.) For example, CSP and EQIP provide monetary incentives for engaging in particular conservation practices such as planting of cover crops or development of contour farming to mitigate erosion, improvement of forages and grazing land, and establishment of fish and wildlife habitat.⁴ MAEAP is a voluntary certification program focused on environmental outcomes,⁵ and it requires practices intended to lower rates of groundwater contamination by fertilizers and agricultural chemicals. A higher score on this index means that a farmer has participated in a higher total combined number of the programs and/or adopted more of the sustainable conservation practices identified in the questionnaire.

This index and other questionnaire data were then analyzed in IBM SPSS Statistics, along with FCM data, in order to evaluate trends across farmer types and conservation attitudes using *t*-tests, ANOVAs, and crosstabs (Lomax and Hahs-Vaughn, 2012).

RESULTS

As **Table 1** shows, our final sample consisted of 16 cherry growers and 15 blueberry growers, all in Michigan's Lower Peninsula. Most farms were in the major fruit growing regions near the coast of Lake Michigan and had sandy soil profiles. Ten pick-your-own operations—

⁴ For more information on the CSP practices see the list at: <https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/csp/> and for EQIP see: <https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/eqip/>

⁵ Information about MAEAP can be found at: <http://www.maeap.org>

farms that are open to the public where individuals can harvest fresh fruit themselves—were included in the sample. Five out of the 31 farmers were either certified organic or utilized organic practices for part or all of their farm. Total blueberry and cherry acres ranged from under a quarter acre to 800 acres, with a mean of 147. About half (15) of the farmers in our sample reported they were 1st or 2nd generation farmers, with the other half reporting longer farm legacies (3rd generation or more). A large majority, 81%, reported conducting some or all of the spraying for pest management on their farm, with 19% having employees exclusively do spraying. The percentage reporting current or past use of nest boxes to attract bird predators for pest management was 45%.

Table 1. Mean differences in mental model metrics and adoption of sustainable practices index by farm type.

	Blueberry Farmers (N=15) Mean $\pm$ SD	Cherry Farmers (N=16) Mean $\pm$ SD	P-value	Pick-Your- Own Farmers (N=10) Mean $\pm$ SD	NON-Pick- Your-Own Farmers (N=21) Mean $\pm$ SD	P- value
# of Factors	18.40 $\pm$ 2.8	16.88 $\pm$ 3.3	.179	17.30 $\pm$ 2.1	17.76 $\pm$ 3.5	.708
# of Driving Factors	8.33 $\pm$ 2.6	6.75 $\pm$ 2.6	.106	7.30 $\pm$ 1.6	7.62 $\pm$ 3.1	.766
# of Ordinary Factors	6.73 $\pm$ 2.6	7.75 $\pm$ 2.8	.302	6.60 $\pm$ 2.6	7.57 $\pm$ 2.7	.357
# of Receiving Factors	1.73 $\pm$ 0.9	1.31 $\pm$ 0.8	.173	1.70 $\pm$ 0.9	1.43 $\pm$ 0.8	.416
# of Connections	36.00 $\pm$ 13.6	37.19 $\pm$ 8.2	.769	35.40 $\pm$ 16.3	37.19 $\pm$ 7.7	.747
C/N	1.98 $\pm$ 0.8	2.25 $\pm$ 0.5	.276	2.06 $\pm$ 0.9	2.15 $\pm$ 0.5	.736
Density	0.118 $\pm$ 0.05	0.151 $\pm$ 0.06	.110	0.129 $\pm$ 0.06	0.138 $\pm$ 0.06	.679
Complexity	0.224 $\pm$ 0.13	0.239 $\pm$ 0.18	.795	0.248 $\pm$ 0.15	0.224 $\pm$ 0.16	.691
Timing Centrality	3.06 $\pm$ 1.5	2.87 $\pm$ 1.2	.6961	3.02 $\pm$ 1.8	2.93 $\pm$ 1.1	.858

Table 1. (cont'd)

Sustainable Practice Adoption Index ⁶	8.33 ± 3.9	11.07 ± 3.5	.057	8.70 ± 4.4	10.16 ± 3.7	.348
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We first analyzed the structural characteristics of farmer's mental models to look for differences between groups, illustrated in **Table 1**. We found some differences between blueberry and cherry farmers, and between pick-your-own and non-pick-your- own farmers in our samples, but most were relatively weak. Mean Sustainable Practice Adoption Index scores, however, were approximately 3 points higher for cherry farmers than for blueberry growers ($P = 0.057$). We also analyzed other categories, including farm size, education level of the farmer, high vs. low spenders on pest management, organic vs. not organic, and found no strong differences based on these groups—we did not compare differences by gender due to the small percentage of women interviewed.

However, when we analyzed the content of the mental models, we discovered stronger differences based on farmer's inclusion or omission of key biological control factors in their mental maps. We found both differences in the structure of mental models and in practice adoption, as shown in **Table 2**, and qualitative differences based on the analysis of the most central factors in mental maps (more on this in the *Centrality of Factors* section below).

Table 2 shows that farmers who included both natural predators and beneficial insects had the highest mean scores for the sustainable practice adoption index (11.55). Those who included neither had the lowest mean score on this index (7.29), and those who included just one of these factors scored in between. In other words, on average, farmers in our sample who included one biological control factor in their mental model had previously utilized 2 additional conservation

⁶ Two farmers are omitted from this outcome due to missing data.

practices in comparison to farmers who omitted them entirely, and respondent farmers who included two biological control factors had utilized 4 additional conservation practices than the farmers who omitted them entirely. Farmers who included both natural predators and beneficial insects were also likely to include more ordinary factors and connections than those who included just one, or neither. We did not find strong differences for inclusion/omission of the other two factors that were added after pre-interviews (cultural/non-chemical practices and bird damage), as nearly all farmers included them in their models (omission of cultural/non-chemical practices, $n = 0$; omission of bird damage, $n = 3$).

Table 2. Mean differences for mental model metrics and adoption of conservation practices index by inclusion/exclusion of biological control factors in Fuzzy Cognitive Maps.⁷

	BOTH (Natural Predators and Beneficial Insects) Included in Map (N=12) Mean $\pm$ SD	ONE (Natural Predators or Beneficial Insects) Included in Map (N=12) Mean $\pm$ SD	NEITHER (Natural Predators nor Beneficial Insects) Included in Map (N=7) Mean $\pm$ SD	P-value (ANOVA)
# of Factors	19.00 $\pm$ 1.9	17.00 $\pm$ 4.0	16.29 $\pm$ 2.6	.129
# of Driving Factors	7.83 $\pm$ 1.9	7.33 $\pm$ 4.0	7.29 $\pm$ 1.0	.882
# of Ordinary Factors	9.08 $\pm$ 2.2 ^a	6.08 $\pm$ 2.5 ^b	6.14 $\pm$ 2.2 ^b	.007
# of Receiving Factors	1.42 $\pm$ 0.8	1.75 $\pm$ 0.8	1.29 $\pm$ 1.1	.468
# of Connections	43.67 $\pm$ 10.6 ^a	32.25 $\pm$ 8.3 ^b	32.00 $\pm$ 10.3 ^b	.012
C/N	2.33 $\pm$ 0.7	1.98 $\pm$ 0.7	2.00 $\pm$ 0.7	.387
Density	0.132 $\pm$ 0.04	0.138 $\pm$ 0.07	0.136 $\pm$ 0.06	.975
Complexity	0.205 $\pm$ 0.16	0.285 $\pm$ 0.15	0.185 $\pm$ 0.16	.317
Timing Centrality	3.56 $\pm$ 1.5	2.69 $\pm$ 0.9	2.38 $\pm$ 1.5	.113

⁷ ^a Groups differ significantly from ^b groups in rows where shown, based on Tukey's post-hoc testing ($p = 0.05$).

Table 2. (cont'd)

Sustainable Practice Adoption Index ⁸	11.55 ± 3.7 ^a	9.27 ± 4.1 ^{ab}	7.29 ± 2.4 ^b	.067
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Group FCMs based on inclusion of biological control factors

Group maps were constructed for farmers who included both natural predators and beneficial insects (**Figure 2**), and those that included neither concept (**Figure 3**). The group maps illustrate only the factors that were included by multiple farmers in order to minimize idiosyncratic results (Fairweather, 2010; Vuillot et al., 2016). Most factors that farmers chose to add are therefore not represented on these group maps, with the exceptions of “yield” and “profitability.” The group map for those including the biological control factors has more connections than those that omit both, illustrating the differences reported in **Table 2** (mean of 44 connections when including both factors vs. 32 when omitting both ($p = 0.012$)). The map including both factors also had a higher complexity score, which is a measure of the ratio of receiver factors to driving factors (mean of 0.205 for farmers including both factors vs. 0.185 for those omitting biological control factors), although this difference was small. Interestingly, only farmers from the group omitting biological control factors considered “profitability” to increase fruit quality (discussed in more detail below).

⁸ Two farmers are omitted from this outcome due to missing data.

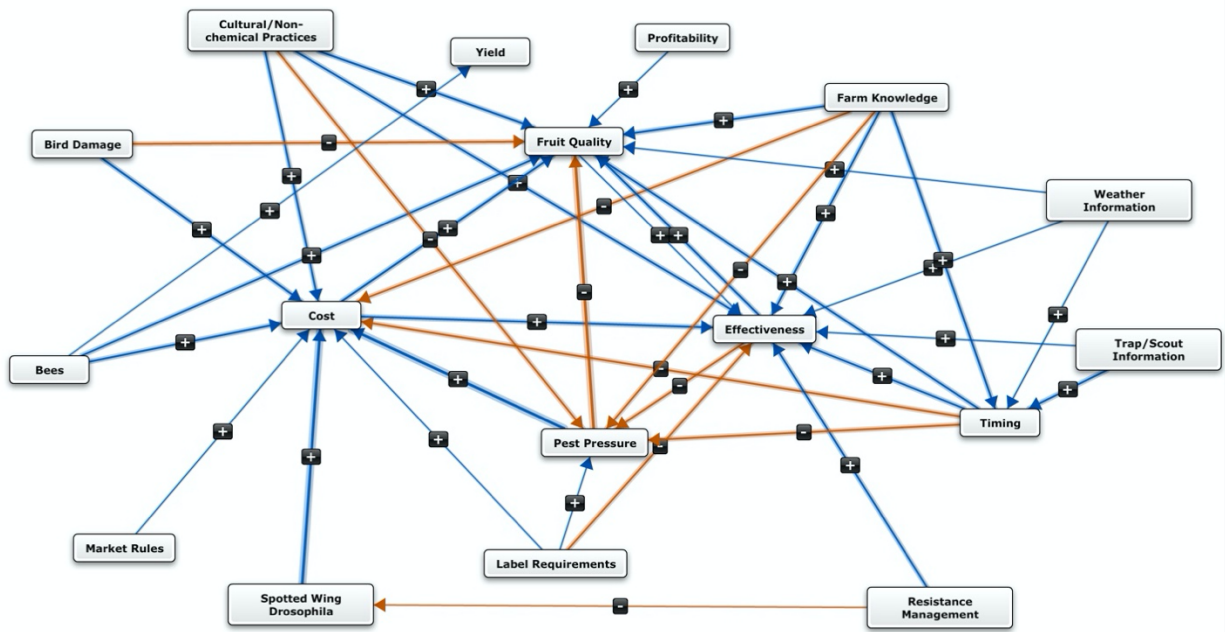


Figure 3. Group map for farmers having neither concept (natural predators, beneficial insects) in their maps. The blue lines indicate a positive relationship (if A increases, so does B) and the red lines indicate a negative relationship (if A increases, B decreases). The thickness of the line indicates the average strength of the relationship for the group of farmers, with thicker lines representing stronger effects, and thin lines representing lighter effects. The arrow indicated the direction of the relationship (A affects B).

Centrality of factors

An individual concept or factor in an FCM can be qualitatively analyzed for the degree of centrality it has in relation to other factors (Ozesmi and Ozesmi, 2004). A factor's "indegree" is defined as the total weight of relationships that are found to affect that factor, and the "outdegree" is the total weight of effect that the factor has on other factors; the absolute values of indegree and outdegree added together makes up a factor's centrality (Nyaki et al., 2014). Generally, the more central a factor is in a map, the more connections it has to other factors in the map, and/or the higher weight given to its connections.

The factors found to be the most central for the 31 farmers were cost, fruit quality, overall effectiveness of the pest management system ("effectiveness"), pest pressure and timing, in that

order. However, as **Figure 4** shows, the farmers including both biological control factors in their mental models had much higher focus on “effectiveness” and “timing” and less concentration on “cost” and “fruit quality,” whereas those who included neither factor had a greater focus on “cost,” and especially on the quality of the fruit. The results for farmers including only one factor were in between the “both” and “neither” groups (except for “pest pressure,” for which they had centrality scores similar to those with “both”). As **Table 2** indicates, the mean centrality of the factor “timing” was higher for farmers including both biological control factors compared to those omitting both (3.56 vs. 2.38, $P = 0.113$). In addition, **Table 1** shows no strong differences for the centrality of timing by farm type.

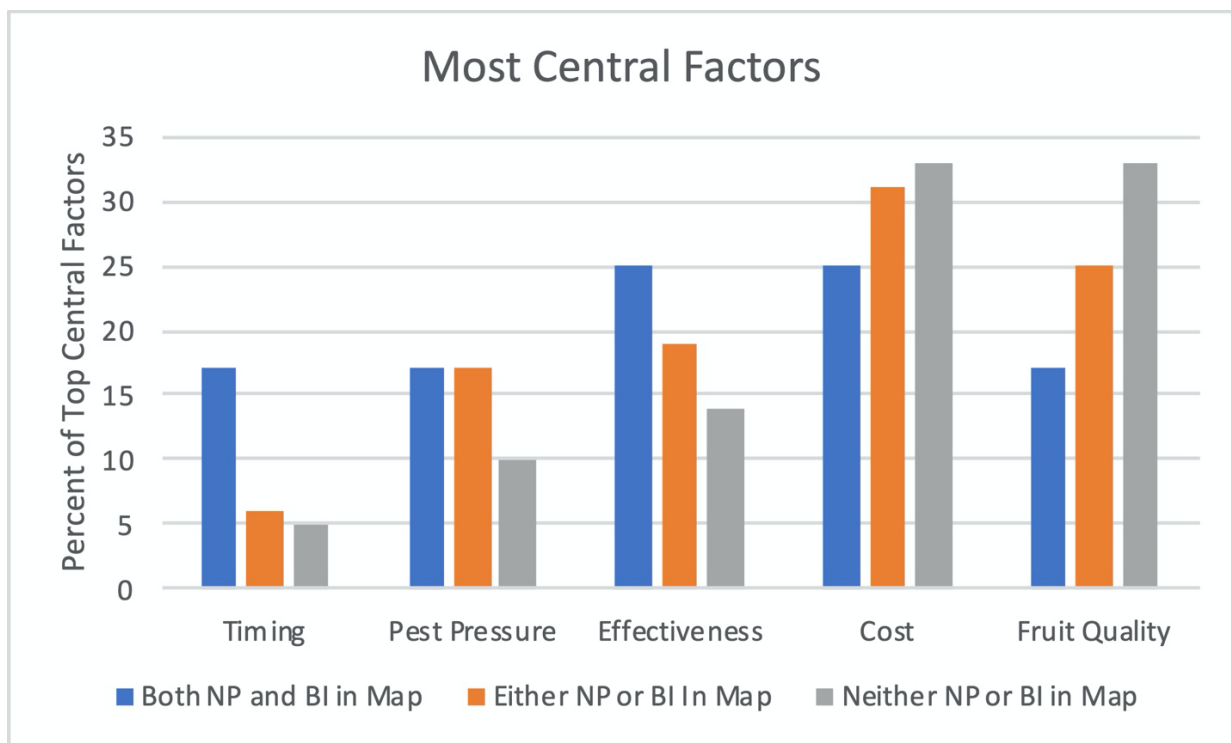


Figure 4. The five highest-scoring factors according to their centrality, based on the inclusion or omission of the factors natural predators (NP) and/or beneficial insects (BI) in their maps. Percentages shown indicate the number of times a particular factor was included in the top three centrality scores for respondents divided by the total number of top three scores (therefore the highest possible score is 33%). For example, 12 respondents included both NP and BI in their maps: 9 had “effectiveness” in their top three scores; the total number of top 3 scores is $12 \times 3 = 36$, and $9/36 = 25\%$.

DISCUSSION

The mental models of the farmers in this study were quite similar overall and did not show strong differences between blueberry or cherry growers, or whether or not they had pick-your-own sales. These commonalities may be due to the similar approaches that farmers take toward pest management as perennial fruit farmers operating in a Midwestern U.S. climate. For example, while there are differences between organic and conventional approaches, both are working to fight the same pest species in similar environments. Farming could therefore be viewed as a cultural practice, with ways of thinking that are highly convergent for larger or macro-areas of management.

Farmers who included biological control factors in their mental models, however, had higher rates of adoption of sustainable conservation practices. While all of the farmers in our sample had awareness of the factors of natural predators and beneficial insects, many did not see them as having a significant role, nor a reliable effect on, the farm system. Those farmers positing a higher level of interaction or connectivity between biological control factors and other factors in the map, however, had a higher number of factors in their model that both affect and were affected by other factors, and as a result, more connections between factors. This group of farmers also made more connections to the factor of “timing,” suggesting an awareness of the temporal dynamics of farming systems that are not easily represented by a static FCM. The results therefore suggest that a higher degree of systems thinking may be associated with a greater likelihood of adopting more preventative pest management strategies and other conservation practices.

Although most farmers likely view fruit quality as having an effect on profitability (higher quality means higher value and/or less pick-outs), only certain farmers from the group omitting biological control factors considered the reverse—that “profitability” increases fruit quality. For

these farmers, such a perception could relate to situations where fruit quality can be sacrificed to save costs if the fruit is intended for a lower- priced market than fresh markets, such as processor markets, because of varietal type or crop damage issues. Considering these cases, higher profit crops result in higher fruit quality because growers will spend more time and money to keep the quality high. While many farmers face such situations periodically, this difference between group mental models could reflect that these farmers employ a more linear pest management approach, one that is more focused on profit and cost, whereas those including biological control factors focus more on overall system effectiveness.

One limitation of this study that while the sample size is appropriate for assessing group mental models, it had less statistical power for analyzing potential associations with behaviors. In addition, the sampling strategy was not random and these farmers are not expected to be fully representative of blueberry and cherry growers in Michigan, therefore the results should be interpreted conservatively. Another limitation is that it was cross-sectional, therefore we were unable to clearly assess the direction of the associations between mental models and the number of conservation practices adopted. Does the adoption of more conservation practices lead to a greater degree of ecological systems thinking, or does an increase in ecological systems thinking encourage the adoption of more conservation practices, or is there an even more complex interaction between the two? Based on feedback regarding the FCM process in our interviews we hypothesize that direction of causality flows from changes in mental models to changes in behavior in most cases, although strong economic incentives for adopting a conservation practice may also lead to changes in mental models. Additional research is needed, however, to clarify these potential pathways.

Educational efforts that focus on bringing ecosystem services concepts into farmers' mental models, including through fuzzy cognitive mapping, may be helpful in increasing adoption of conservation practices. The semi-structured interview data provides evidence that for some interviewees, the fuzzy cognitive mapping process was helpful for better understanding the interrelatedness of different factors, for example the place or significance of natural predators. While more experiments and/or evaluations of systems thinking outreach efforts are needed to confirm the efficacy of this approach and to refine pedagogical methods, our results suggest that such efforts should assess farmers' current mental models to identify the degree to which they already converge and build upon those existing factors and relationships. For example, Michigan cherry and blueberry growers most frequently associated the factor "natural predators" with the level of bird damage, pest pressure, cost, and fruit quality, whereas "beneficial insects" were most frequently associated with the level of pest pressure, cost, and cultural/non-chemical farming practices. "Cost" was a central variable for all farmers, therefore outreach that emphasizes the connections and feedbacks between this factor and ecosystem service factors may facilitate more systems thinking. In addition, "timing" was a central variable for farmers that included biological control factors in their mental models. Providing information about the timing of tasks to farmers and other resource managers could be helpful for making informed decisions about conservation practice adoption, particularly for those who are already using more preventative approaches. Sharing such practical knowledge could increase awareness and even favorable perceptions of the practice, potentially leading to higher rates of adoption (Prokopy et al., 2019).

In addition, the process we used, and the greater use of FCM generally, could help researchers to characterize potential differences in mental models for other agricultural products and for regions outside of Michigan to better inform how "ways of thinking" and behaviors or

behavioral intentions and attitudes are related. This could be done individually, as in our study, but group FCM workshops could provide a venue for group knowledge sharing (Voinov and Bousquet, 2010; Van der Sluis et al., 2018), and could stimulate discussion of ecosystem services between farmers who are using more conservation practices and those who are using fewer. This has the potential to shift the highly convergent mental models of farmers toward a more preventative approach to pest management. Greater use of FCM may therefore help farmers develop a better understanding of farm ecology and cultivate more ecosystems thinking (Devisscher et al., 2016), as well as bridge knowledge gaps between farmers and academic researchers (Garbach and Morgan, 2017; García- Barrios et al., 2017).

CONCLUSION

This study analyzed mental models of blueberry and cherry farmers in Michigan and their associations with conservation practices and/or participation in conservation programs. Those who demonstrated more ecological systems thinking, as measured by more biological control factors in their model and more ordinary factors—those that both affect and were affected by other factors—were likely to report higher rates of adoption, as well as more connections to the dynamic factor of timing. Conversely, those who did not incorporate certain biological control factors in their model had a greater focus on cost and were likely to report lower rates of adoption of conservation practices. These results add to our understanding of the relationships between ecological systems thinking and differences in the use of preventative pest management practices. Although more research is needed to clarify the causality of these relationships, future work should emphasize connections and feedbacks involving the system factors that farmers already view as important.

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CHAPTER 3. *A bird's eye view: Fruit grower interest in adoption of raptor nest boxes.*^{9,10,11}

ABSTRACT

Bird damage is a serious problem for many fruit growers. Utilizing nest boxes to attract natural predators of fruit-eating birds is frequently effective in lowering bird damage, as well as increasing fruit marketability. The adoption of a conservation practice, however, depends on a grower's level of interest. What is the level of interest in nest boxes, and how do growers perceive the influence of natural predators on the farm ecosystem? To answer these questions we conducted an online national survey of cherry and blueberry growers focusing on potential interactions between key farm variables. We found a surprising consistency in perceptions of the functioning of the farm ecosystem and a high level of agreement on how natural predators affect other production factors. Growers typically perceived nest boxes to lower bird damage and pest pressure, and to raise fruit quality and income. They also indicated a significant interest in installing nest boxes, and strong agreement that extension and outreach related to the costs, benefits and timing of implementation of nest boxes would be helpful.

INTRODUCTION

Bird damage is a serious issue in fruit systems (Hannay et al. 2019; Lindell, Hannay, and Hawes 2018), with damage costing hundreds or even thousands of dollars per hectare (Anderson

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¹¹ The data that support the findings of this study are openly available in the openICPSR repository at <http://doi.org/10.3886/E112171V2>, with the exception of the semi-structured interview data, which can be made available upon reasonable request.

et al. 2013). Certain landscape management and conservation practices can be helpful in managing pests (Liere, Jha, and Philpott 2017). Raptors, for example, are perceived by some growers as highly beneficial for vertebrate control, insect control and improved yields (Kross et al. 2017). Nest boxes can be used to encourage raptors such as kestrels or owls to populate the vicinity of the farm, which may lower the presence of fruit-eating birds (Lindell et al. 2018). The adoption of raptor nest boxes may provide marketability advantages as well, as consumers are increasingly seeking food produced with natural and organic practices (McFadden and Huffman 2017). For example, a recent study of apple growers in France reported that the use of ‘natural enemies’ was communicated to consumers in their direct marketing (Salliou and Barnaud 2017). Consumer studies in the United States have found that natural methods of bird control in fruit systems were preferred over live ammunition and nontoxic (methyl anthranilate) sprays (Herrnstadt et al. 2015), and that there is a willingness to pay small price premiums for fruit produced using nest boxes (Oh, Herrnstadt, and Howard 2015). However, less is known about growers’ interest in adopting nest boxes.

American kestrels are a predator of fruit eating birds (Shave et al. 2018) and their habitats can include agricultural landscapes (Touihri et al. 2019). Nest boxes can be used to encourage kestrels to occupy an area, in turn helping to increase their local population numbers (Shave and Lindell 2017b). For example, when nest boxes were installed in cherry orchards in Michigan, kestrels occupied and nested in them at high rates, significantly increasing the presence of these raptors during the growing season (Shave and Lindell 2017a). The presence of kestrels then lowered the presence of fruit-eating birds in the orchards, as they sought to avoid being hunted by the predatory bird. This ultimately resulted in decreased bird damage in the fruit (Shave et al. 2018).

The practice of installing nest boxes is relatively inexpensive. The startup cost is low, estimated to be about \$115 per box, and yearly maintenance costs are about \$23 (Shave et al. 2018). One box can cover many hectares due to the fact that American kestrels have a large territory; it is recommended that boxes be placed no closer than 0.8 km (a half mile) to each other (Shave and Lindell 2017b). Overall time demand for the practice is low, and most of the steps (e.g. cleaning out the box, installing new nest material) do not occur during the busy seasons.

However, the value of the nest box practice can vary by crop or variety. While American kestrels are effective in decreasing damage from pests during the cherry season, for example, they stop nesting mid-way through Michigan's blueberry season. This results in the lowering of fruit damage during the first half of the season when early varieties are being harvested but provides fewer benefits during the second half of the season, when kestrels and their fledglings have left their nests.

Current evidence suggests the practice of using nest boxes to attract natural predators is a low-cost method of bird damage management that has been shown to be effective in certain contexts (Shave et al. 2018). Potential marketing benefits may also be obtained with greater consumer awareness, but more needs to be known about the level of interest that growers have for adopting nest boxes. Recent research has reported a high level of grower support for adopting low cost methods of improving habitat for native pollinators in apple production systems (Park et al. 2020). Much less is known, though, about fruit growers' perceptions of the potential benefits of raptors in their farming systems. This study attempts to address this information gap by analyzing fruit growers' perceptions of natural predators, and their perspectives on the feasibility of nest box use on their farms.

MATERIALS AND METHODS

Data collection

In order to learn more about growers' interest in nest boxes and their perceptions of how natural predators influence the farm ecosystem, we administered a national survey of blueberry and cherry farms. We asked about levels of bird damage and the abundance of natural predators existing in their areas. We also inquired about the relationships between a number of central farming factors, including costs, pest pressure, and fruit quality for examples, and how these interacted with ecosystem service factors such as natural predators. In addition, we measured growers' interest in nest box adoption, and their perceptions of the marketability of this practice.

The survey instrument was developed using stakeholder input, including growers, cooperative personnel, agricultural extension agents, and researchers. The survey was also informed by 31 qualitative interviews that were performed with Michigan blueberry and cherry growers the winter/spring prior to the survey's implementation (Bardenhagen, Howard, & Gray, 2020).

The survey was administered in the mid-winter/early spring of 2018 in order to avoid the busier times of year for growers and achieve a better response rate. Industry contacts and extension personnel helped to disseminate the survey electronically to their grower lists and members in the case of cooperatives. Qualtrics (Provo, UT) was used as the online platform, which enabled the survey to be taken using mobile devices. It was designed to take about 10 minutes or less on average, which was tested with stakeholders and graduate students.

The survey had three parts; the first part gathered information about the farm, conservation practices used, perceptions of consumer preferences, and demographic data. The second part provided information about the adoption of nest boxes, which was based on recent research that

evaluated raptor occupancy rates, the prevalence of fruit-eating birds, and the typical costs and benefits of the practice (Shave et al. 2018), and then assessed growers' interest in adopting nest boxes. The third section used Likert scales to evaluate perceptions of the relationships between key factors in the farming system.

Analysis

We analyzed the data using both quantitative and qualitative methods. Fuzzy cognitive mapping, a semi-quantitative method (Morone, Falcone, and Lopolito 2019; Teixeira et al. 2018), was used to analyze the relationships between farm factors, including the evaluation of potential scenarios (e.g. an increase in pest pressure.) The goal was to assess what impact growers expect to see with system changes, and how much they varied among respondents. SPSS software was used for quantitative analysis, including frequency tests and t-tests to compare means.

RESULTS AND DISCUSSION

Our survey respondents included 99 blueberry growers and 37 cherry growers in the United States, mostly from the Midwest, Northwest, and the South (primarily Georgia). After excluding responses with large amounts of missing data, we had 129 analyzable responses. As **Table 3** indicates, some growers (7%) grew both blueberries and cherries, and there were a significant number of growers with pick-your-own operations (29%), as well as organic growers (31%). A minority, 38%, reported using nest boxes for bird management either currently or in the past.

Table 3. Number of respondents by farm type, location, and bird damage management (n=129¹²).

Farm Type	Number of Respondents (%)
Blueberry Only	90 (71%)
Cherry Only	28 (22%)
Both Blueberry and Cherry	9 (7%)

¹² Two growers did not report their crop type, and one did not report their location.

Table 3. (cont'd)

Midwestern	42 (33%)
Western	64 (50%)
Southern	18 (14%)
U-pick	38 (29%)
Organic	40 (31%)
Used at least one method of bird damage management	112 (87%)
Used more than one method	90 (70%)
Has used nest boxes	49 (38%)

This small sample size complicates making generalizations about cherry and blueberry growers in the United States. It is likely not very representative due to the possibility that those with a greater interest in nest boxes responded to the survey at higher rates.

The results are interesting, however, because of the surprising consistency with which growers detail the relationships between farming factors. Growers from a wide variety of categories (blueberry growers, cherry growers, organic growers, pick your own operations) tended to agree on how natural predators would affect the farm system, as well as how the core farming factors interact with one another. Some of this is likely due to blueberry and cherry growers having similar growing conditions and pest types, but may also be due to having similar management approaches based on similar perceptions of farm system interactions.

Bird damage

Our survey results indicate that bird damage is a significant issue for 66% of growers. When asked how much of a problem bird damage is, the average reported value was 3.37, where 1 = “not much of a problem” and 5 = “a big problem” (**Table 4.**)

Table 4. Level of bird damage reported by growers.

Bird damage is how much of a problem on the farm:	Not much of a problem 1	2	3	4	A big problem 5	Average score:
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Table 4. (cont'd)

	6%	4%	21%	22%	47%	3.37
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In addition, a very large proportion of growers, 87%, have tried some method of bird damage management, and most have tried more than one method (70%) (see **Table 3.**) Qualitative data gathered from the interviews conducted prior to the survey also indicated that bird damage can be a significant problem, with some growers reporting events where entire flocks of birds descend on crops at once.

Farm ecosystem factors and the effects of natural predators

The survey respondents have a high level of agreement on the relationships between central fruit system factors, and the effects that natural predators have on these production factors. For example, when asked what would be expected to happen to production costs if there was a significant increase in pest pressure on the farm, 83% indicated that it would either increase some (47%) or increase significantly (36%). Only 11% thought an increase in pest pressure would not affect production costs (see **Table 5.**). When asked how an increase in bees would affect income, 81% indicated that it would either increase some (67%) or increase significantly (14%). In other words, the vast majority of growers perceive the relationship between these two factors to move in the same direction.

Table 5. Scenario: How an increase in pest pressure, bees, or natural predators is perceived to affect other factors in the system, by percent of survey respondents.

An increase in pest pressure will cause:	Increase significantly	Increase some	Stay the same	Decrease some	Decrease significantly
Cost/spending to:	36%	47%	11%	3%	3%
An increase in bees will cause:					
Income to:	14%	67%	13%	6%	1%

Table 5. (cont'd)

An increase in natural predators will cause:					
Pest pressure to:	3%	9%	6%	58%	24%
Cost/spending to:	3%	8%	18%	61%	10%
Fruit quality to:	17%	55%	18%	6%	4%
Income to:	15%	68%	6%	6%	6%
Bird damage to:	3%	6%	6%	56%	29%

The survey respondents also had a high level of agreement about the effects that natural predators would have on other farm production factors. **Table 5** shows, for example, that for 82% of growers, an increase in natural predators is likely to cause a decrease in pest pressure (58% noted “some” decrease and 24% noted “significant” decrease).

Our results show that respondents generally agree that natural predators will have beneficial effects on production and farm income overall. Specifically, increases in natural predators are expected to lead to a lowering of costs and pest pressure, and a rise in fruit quality and total income.

Nest box support/Interest in adoption

Growers reported a significant level of interest in nest box adoption. The average score for interest in adopting nest boxes on their farm was 3.99, where 1 = “not interested”, 5 = “highly interested” (**Table 6**). The average score for interest in adopting the practice as part of a larger industry effort was 3.85. Such a collective effort might enable the industry to incorporate the use of nest boxes into eco-labels with “raptor-friendly” criteria in the future.

Table 6. Grower interest in adopting nest boxes.

Level of interest for adopting nest boxes:	Not interested 1	2	3	4	Very interested 5	Average score:
At the individual farm level:	6%	4%	21%	22%	47%	3.99

Table 6. (cont'd)

As a whole industry effort:	7%	5%	27%	22%	40%	3.85
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These results indicate that many growers may be willing to put time and resources toward conservation practices that have measurable benefits, particularly if they have previous experience with conservation practices. Previous research, for example, has found that some growers perceive a value in the stacking of ecological services through the adoption of multiple conservation practices (Penvern et al. 2019). In our survey organic growers reported a higher rate of nest box adoption (50% versus 33%) in addition to higher rates of adoption of other conservation practices, such as encouraging beneficial insects (63% versus 44%), mulching (83% versus 56%), and developing pollinator habitat (55% versus 34%).

Perceived marketing potential

Our results also suggest a potentially untapped marketing advantage for communicating the use of nest boxes in fruit production. When we asked growers about their perceptions of consumer preferences, they reported conservation practices as having a similar level of importance to ‘local’ origin for consumers. On a scale where 1 = “not important,” and 5 = “very important,” 80% of growers marked conservation practices as having a level of importance of a 3 (29%), a 4 (27%), or a 5 (24%), with an average score for all growers of 3.50 (**Table 7**). Local origin importance was a 3 or higher for 84% of growers, with an average of 3.81.

Table 7. Grower perceptions of consumer preferences.

Level of importance to consumers:	Not important 1	2	3	4	Very important 5	Average score:
Conservation practices	6%	13%	29%	27%	24%	3.50
Local origin of product	8%	8%	17%	29%	38%	3.81

Outreach preferences

With respect to conservation practices, respondents reported a desire for information about the benefits of a practice, as well as about the timing of tasks related to implementing it. When asked if the provision of such information by extension or other industry outreach would make the grower more likely to adopt a practice, growers reported an average score of 4.22, where 1 = “strongly disagree”, 5 = “strongly agree” (**Table 8**).

Table 8. Agreement with the statement “I would be more likely to use a conservation practice if Extension or other industry support provided information about the benefits, and when and how to implement the practice.”

Level of agreement:	Strongly Disagree 1	2	3	4	Strongly Agree 5	Not Sure	Average score:
More likely to adopt if regular information is provided:	0%	4%	21%	30%	40%	6%	4.22

Our results align with research conducted by Park et al. (2020, 10), which found that growers are interested in adopting low-cost methods to achieve the conservation goal of increasing native pollinators, but that additional outreach information is needed – “clear guidelines to implement management practices” was rated only below “proven effectiveness of native pollinators” in their study of apple growers in New York and Pennsylvania.

Limitations and suggestions for future research

A key limitation of our research is the relatively small sample size and low response rate. While we made the survey widely available through industry contacts, high response rates to online surveys are becoming increasingly difficult to achieve (Ives and Kendal 2013; Vassalos and Lim 2016), as growers receive a rising number of survey requests. This likely biases our results toward growers that already have interest in conservation practices. The relatively high level of organic

growers in our sample (31% of all respondents) lends support to this possibility. Future research might build on the high degree of interest indicated in these results to obtain more buy-in from key industry stakeholders, and gauge interest in an industry-wide marketing initiative for the wider adoption of nest boxes. Interest in this practice among growers of other types of fruits, such as grapes and apples, could also be explored.

A limitation to exploring the feasibility of adoption of kestrel nest boxes by fruit growers is that it is difficult to estimate the costs and benefits across different farming contexts. More research on other crops and other regions of the U.S. is needed. Where the benefits are negligible growers will be expected to be less interested, perhaps even if the cost-benefit ratio is positive. More research on the benefits of cooperation and the potential landscape level effects of wider-scale adoption is also needed. More nest boxes in an area could encourage a larger existing population of raptors, leading to a higher rate of nesting occupancy in boxes that are installed. Higher occupancy rates in growers' boxes could lead to greater increases in raptor population, and as a result, might lower the population of fruit-eating birds at the regional level (Shave and Lindell 2017b).

CONCLUSION

The blueberry and cherry growers we surveyed had a high level of agreement on how the relationships between natural predators and other farming factors work, indicating that natural predators are widely expected to have beneficial effects on their farm ecosystem by lowering costs and pest pressure and increasing fruit quality and income. In response to information we provided about the cost and effectiveness of nest boxes in recent studies, these growers showed a significant level of interest in adopting them in their own operations, as well as promoting them in industry-

level marketing efforts. Responding growers perceived that conservation practices have a marketing value nearly as high as ‘local’ origin for consumers. They also indicated that it would be useful for them to have information related to the steps and timing of the nest box practice provided at regular intervals. We suggest that university extension and/or other industry outreach could provide information about when to put up boxes, check them, and clean them, perhaps by inclusion in regular extension updates for growers of specific fruit crops.

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CHAPTER 4. *France's Organisme de Défense et de Gestion: A model for farmer collective action through standard development and brand management.*¹³

ABSTRACT

Regionally-based food production can provide farmers with new, value-added markets and consumers with access to place-based high-quality products, which may also benefit local economies through increased commerce. French Organismes de Défense et de Gestion (ODGs) illustrate a mode of regionally-based, agri-food business organization. ODGs focus on the development of production standards and management of the intellectual property related to those standards. This mode, which is commonly used in Europe, has not often been used in the United States, despite its potential for regional food system development. The ODG mode may provide certain advantages, such as the ability to assemble farmers and value chain actors in a collective food product branding effort while remaining in compliance with anti-trust laws—an ODG does not actually buy or sell the products it certifies. Here we describe French ODGs, their legal requirements, and their institutional supports and development processes. We compare relevant French corporate law to that of the United States, using Michigan as the example, and describe how the ODG mode can be organized using existing state statutes, provided steps are taken to ensure compliance with anti-trust laws. We discuss how certain French institutional supports can be replicated by adding specific provisions to organizational documents, and how others can be replicated by utilizing private institutional structures, such as a nonprofit umbrella brand. Finally, we discuss the circumstances for which the ODG mode could fit well, and conversely describe specific situations where an ODG may be less ideal. The ODG model has significant potential for

¹³ The aspects of this study involving human participants were reviewed and approved by the Michigan State University Human Research Protection Program, Exempt Category 2: MSU Study ID: STUDY00001089.

branding of value-added farm and food products, but as with any mode of organization or business entity, it is not a panacea.

INTRODUCTION

Regionally-based food production may bring a number of benefits to farmers and consumers alike. Farmers may develop alternatives to commodity markets by focusing on qualities that consumers are increasingly seeking out at a wide variety of levels. One type of quality arises from using particular plant or genetic varieties that are flavorful, but perishable—often limiting markets to a more local geographic scope. Another interesting type of quality relates to products grown or raised in particular ways, such as pastured poultry or grass-fed beef, which speak to interest in animal welfare, omega-3 nutritional profiles, and environmental concerns (Romig, 2013). Depending on the product, these may be marketed at a local or regional level. There are many place-based foods that have a particular quality due to special geography, genetics, and/or production methods, which can be marketed nationally or even globally depending on the product (for examples, Idaho Potatoes, Roquefort Cheese) (Owen et al., 2020). The production for each of these quality types usually arises from regionally-based efforts, in contrast to commodities which are aggregated from many points around the world. Regionally-based food production may increase choice and availability of healthy food options (Fischer et al., 2015), while providing the farmer with a larger share of the food dollar either through shorter supply chains or value-added premiums (Nousiainen et al., 2009), thereby contributing to the agricultural economy (rural and urban) through food business development (Renting et al., 2003).

A variety of types or modes of organization are used to develop regionally-based food production in the United States. These include farmers markets, community supported agriculture

arrangements, food hubs, cooperatives and other social entrepreneurship-focused business entities, standard business entities, and other governance modes such as state or federal marketing orders. Due to the many complexities to local and regional food system development, it is important for practitioners to identify the best mode to fit a particular effort that will match the specific needs of farmers and other actors involved.

Different methods of business organization are often shared by practitioners across states or countries through research and networking. For example, the Limited Liability Company (LLC) form was created by legislation in Wyoming in 1977¹⁴ and provides multiple benefits over traditional corporations, such as pass-through taxation and a high degree of organizational flexibility. LLC legislation was later adopted by the other states, and now LLCs are one of the most often used forms used to start a business¹⁵ due to their value for small business development. Although the specifics of using a particular method or mode of organization will vary from one legal system to another, the underlying purposes are usually translatable to other contexts. France has adopted a similar form called the *Société à responsabilité limitée* (SARL).¹⁶ New forms and methods of organization in many cases require enabling legislation to be passed, such as with the LLC. However, some new forms and methods of organization can be utilized in a new jurisdiction using its existing laws.¹⁷

¹⁴ Wyoming Limited Liability Company Act, Wyo. Stat. Ann. §§17-15-107(a)(viii)-(ix), 17-15-113, 17-15-122 (1977). See also Keatinge, R. R., Ribstein, L. E., Hamill, S. P., & Gravelle, M. L. (1992). The Limited Liability Company: A Study of the Emerging Entity. *Bus. Law.*, 47, 375.

¹⁵ For example, in Michigan during January 2021, 12,148 new LLCs were created versus 1,080 new corporate entities. Total number of Michigan domestic LLCs in good standing as of October 1, 2020 is 623,400, versus 159,799 for-profit corporations. Source, Michigan Department of Licensing and Regulatory Affairs, accessed on 3/11/21 at https://www.michigan.gov/lara/0,4601,7-154-89334_61343_35413-114907--,00.html

¹⁶ *Code des Sociétés*, L. 223-1 to L. 223-43, R. 223-1 to 223-36.

¹⁷ For examples, worker cooperatives can often be organized using a state's general cooperative statutes or even other entities; and benefit corporations can be created on an ad-hoc basis in Michigan due to the specifics of Michigan corporate law. However, legislation creating a statutory basis for a new form can provide structure and legal clarity for practitioners and regulators, which will lower the costs of organization for businesses.

In Europe, farmers have developed multitudes of products that incorporate production standards with the intellectual property associated with quality signs. While not exclusive to Europe, quality signs have been promoted at the European Union (EU) level for decades as a strategy for rural development and one means of cultivating and protecting the agricultural sector.¹⁸ Groups of farmers can use quality signs as a method for creating added value and increased sales through developing reputation. Geographical Indications (GIs), for example, establish an association and connection to a region such as Champagne wine, and can be an effective means of protecting against dilution of quality or co-optation by the larger industry (Busch, 2018).

EU regulations require applicants seeking to use a quality sign to be a “group” made up of “mainly producers.”¹⁹ This group must develop production rules called “specifications,” oversee production controls, and manage the defense of the sign.²⁰ However, these groups do not actually commercialize the products—their members do. Countries within the EU can have additional requirements for these collective management organizations.

France is the birthplace of quality signs from both an intellectual property and an institutional programming perspective. Legislation to protect place-based quality products dates back to 1919 (Faulhaber, 2004), and several quality sign programs have been created since then. The first official quality sign France created was the famous *appellation d’origine contrôlée* (AOC), which provided intellectual property protection and brand labeling for products having a connection to *terroir*, loosely translated as a taste of the earth or place that a product was grown and produced (Barham, 2003). Another quality sign program France developed is the Label

¹⁸ Council Regulation (EEC) No 2081/92 of 14 July 1992 (repealed by EC 510/2006, further repealed by EC 1151/2012).

¹⁹ EC 1151/2012 Article 3.

²⁰ *Id.*

Rouge. Started in 1965 (Westgren, 1999), the Label Rouge is lesser-known internationally, but well known domestically. The label is held as a certification mark by the French Ministry of Agriculture, and permission to use the label is granted to applicants that can prove that their product is considered to be of higher quality than the standard version of a product in consumer taste tests and organoleptic lab testing (Westgren, 1999).²¹ Label Rouge products are marketed almost exclusively domestically, with many products found only in certain French *régions*. The Label Rouge program is unique to France and has not been replicated by other countries.

The French AOC program became the model for the EU's Protected Designation of Origin (PDO) and the Protected Geographical Indication (PGI) programs created in 1992 (Marie-Vivian, Bérard, et al., 2017).²² The PGI program requires a link between a product and the place it originates, whereas qualification for the PDO program requires that all steps of production, including processing and further transformation such as cheese ripening, occur in the designated region.²³

Each of the abovementioned official quality sign programs serve as “umbrella” brands and an institutional structure for development and approval of products is provided by governments, both at the member state and the EU level. However, the quality products themselves are managed within the private sector, by the groups of farmers and other agricultural businesses involved in production.

Often referred to as quality groups, collective organizations are used to manage quality sign projects. These quality groups must comply with certain program regulations, which have

²¹ See also *Code Rural*, L. 641-1 and R. 641-9.

²² See also Council Regulation (EEC) No 2081/92 of 14 July 1992.

²³ The European Commission has a webpage dedicated to explaining these “quality schemes” available in multiple languages: https://ec.europa.eu/info/food-farming-fisheries/food-safety-and-quality/certification/quality-labels/quality-schemes-explained_en

seen changes over the years. Prior to 1998, quality groups could perform product controls internally, certifying their own members to be able to use the quality sign logo. However the passing of European Standard EN 45011 required quality groups to use independent organizations for certifying their members' products. In France, this meant that groups managing Label Rouge and PGI signs had to begin to work with third party control organizations quickly, whereas the holders of the AOC/PDO sign were able to continue to be overseen by a special department of the French Ministry of Agriculture until 2006, after which each of the signs were required to use control organizations for certification (Marie-Vivian, Bérard, et al., 2017).

A French ordinance passed in 2006 restructured the Institut National de l'Origine et de la Qualité (INAO), making it the main institutional support for each of the quality signs in France.²⁴ Groups seeking quality signs were required to organize their collective management body as an Organisme de Défense et de Gestion (ODG) and to apply for use of a quality sign through the INAO.

For reasons described in this paper, French ODGs represent perhaps the most legally advanced, institutionally supported version of collective management body used for the quality sign mode of agri-food organization. Our comparative research addresses the question of whether this mode can be readily replicated in the United States, and furthermore, what additional mechanisms are needed to meet the standards of the French ODG.

Methods used

I performed legal research of ODGs using French codified law, statutes, and regulation. Among the resources used were statutory code books, online code via Legifrance,²⁵ European

²⁴ Id; L'ordonnance n° 2006-1547 du 7 décembre 2006.

²⁵ <https://www.legifrance.gouv.fr>

Commission information,²⁶ programmatic informational documents, and INAO *directives* and guides. Our description is also strongly informed by the perspectives gained from extensive interviews conducted in France in 2018 and 2019 with farmers, managers and value chain operators from 12 ODGs, government staff and INAO outreach agents, consultants, and researchers (42 total interviews).²⁷ A grounded theory method was used for analysis of the qualitative interview data (Glaser & Strauss, 1967), which allows a researcher to search for themes that emerge from the data, rather than applying preconceived concepts (Peterson, 2011). As such, several interviews were initially searched for concepts that were then used to develop codes. After trial and error with several other interviews to create the final list of codes, each interview was coded by tagging excerpts that were relevant to each code using Dedoose software.²⁸ The resulting excerpts were analyzed by theme and summarized to help describe ODG development and operation. We also reviewed the organizational documents (*statutes*) from the 12 ODGs researched (note: the term “operators,” which will be further defined below, refers to farmers and any other value chain actors such as processors and packers whose actions are implicated by any of the production rules of the quality sign).

Plan of the chapter

This chapter will proceed as follows: Part I will describe the characteristics of ODGs—their function and purpose, unique legal requirements, and the institutional support they receive for development and oversight. Part II will compare the method of organizing an ODG under French corporate law with that of the United States to develop and manage a set of production

²⁶ <https://ec.europa.eu>

²⁷ The aspects of this study involving human participants were reviewed and approved by the Michigan State University Human Research Protection Program, Exempt Category 2: MSU Study ID: STUDY00001089.

²⁸ Dedoose Version **8.0.35**, (2018). Web application for managing, analyzing, and presenting qualitative and mixed method research data. Los Angeles, CA: SocioCultural Research Consultants, LLC www.dedoose.com.

standards—more specifically, organizing an ODG in Michigan.²⁹ For this part, three levels of organization building will be considered: a) meeting base minimum purposes and requirements b) incorporation of certain aspects and benefits of the French model and c) replication of a variety of institutional supports. Part III will explore the “organizational fit” for ODGs in the U.S.: under which circumstances would the ODG mode be appropriate, and in which situations would it not be a good fit.

DESCRIPTION OF ORGANISMES DE DÉFENSE ET DE GESTION

Qualification as an ODG is necessary for collective management organizations to utilize French quality signs programs, and there are statutory requirements imposed on ODG structures. As such, ODGs have many of the characteristics of a business entity (or quasi-entity). Here we provide information regarding the basic functions and purposes of ODGs, their legal requirements, development process and oversight.

Functions, purposes, and missions

As France’s chosen form for a collective management body, the main function of ODGs is to develop and manage a quality sign product or products. France’s very specific outlines for the functioning of ODGs relate to the basic purposes of its quality sign programs: rural development and farm viability, especially in remote and rugged areas, enable equitable sharing of the profits within the supply side of the value chain,³⁰ and farm competitiveness in the national and international marketplace.³¹ There are varying requirements for each of the programs, but at the

²⁹ Michigan was chosen as the first author is a Michigan attorney and member of the State Bar of Michigan.

³⁰ *Code Rural*, Art. L. 640-1; as one development researcher/practitioner stated, quality sign organization is intended to be “...a type of bottom-up labélisation ... that is original because it is rooted in local elements, ... it is up to the local group of stakeholders to define the contents of the code of practice [specifications]...”

³¹ A national strategy of increased farmer adoption of or inclusion in quality sign projects is being promoted under the current administration. There are some who have concerns, however, that such a policy could lead to a watering down of quality.

heart of each is the purpose of providing consumers information about the quality of products.³² As such, ODGs create production standards and promote their brand, however, ODGs do not produce or sell the products themselves – it is their farmer, cooperative, or processor members who actually commercialize the products.

The definition of quality also varies to some extent with each of the programs. Quality for the Label Rouge program effectively means a better sensory experience based on taste tests, whereas quality for the AOP/PDO program is based on the “taste of place” or *terroir*, and quality for the PGI program relates to the fact of being raised or processed traditionally in a particular place. As stated by an INAO agent (translated from French), “It has to be a product that is genuinely specific. You need to be careful: it doesn’t necessarily have to be a quality product in the sense... how can I put this? It must satisfy certain organoleptic specificities, but it’s not a product that will please everyone.” While each quality sign product might not be preferred by all consumers, one of the main public purposes behind the programs is to efficiently transmit knowledge about these high-information cost goods (Moser et al., 2011).³³ For farmers and other operators of ODGs, this leads to increased product reputation, which further translates into new markets, increased sales, and/or higher prices.³⁴

The statutory missions for ODGs are clearly defined in the French Rural Code.³⁵ These include development of the product specifications (“*cahier des charges*,”) putting in place a

³² *Code Rural*, Art. L. 640-1; *Code Rural*, Art. L. 641-1 to 641-13 defines the details of the “signes d’identification de la qualité et de l’origine.” The Label Rouge program’s focus is on “qualité supérieure,” and the AOC/PDO and PGI programs’ focus is on qualities that are specifically connected to a place.

³³ See generally, Moser, R., Raffaelli, R., & Thilmany, D. D. (2011). Consumer preferences for fruit and vegetables with credence-based attributes: a review. *International Food and Agribusiness Management Review*, 14(1030-2016-82774), 121-142, describing experiential goods as those that can’t fully be evaluated before purchase, and credence products as those that require trust in information provided, because consumers can’t fully determine the nature of the good before or after the purchase (e.g. the attribute of origin). Quote from an ODG manager (translated from French): “There’s a real demand from society as a whole for us to explain how we work.”

³⁴ As one small farm-market-oriented vegetable farmer put it, “... it’s just the same as being organically certified, you don’t have to justify yourself.”

³⁵ *Code Rural*, Art. L. 642-22.

control and inspection plan, and defending and promoting the name of the product as intellectual property³⁶ (each of these are visited in more detail below). Also included are requirements to communicate with the INAO for oversight purposes, such as to transmit a current list of operators and provide relevant budget information at INAO's request.³⁷ The missions outlined in the Rural Code were normally included in the ODGs' organizational documents.

Development of production specifications

Creating and managing product specifications form the core of the ODG's functions. Referred to alternately as "specifications" and "*cahier des charges*," the production rules detailed by the specifications become the intellectual property of the ODG, and essentially are what are promoted, defended, and controlled by the control plan. To meet its obligation, an ODG will provide a space for communication and negotiation between the farmers and other value chain operators. For the cases we studied, many times the baseline of the specifications was simply the methods that farmers were already using for production, as the main idea is to include the practices and genetics that result in the typical product. However, for AOP/PDOs and PGIs, delineation of the geographical area, and sometime approved micro-climates within it, is part of the specification-building process. While this process is simple in concept, detailing the production rules can be quite complex, including sizing, shape conformation, packaging and storage box sizes, and even sucrose (brix) levels.³⁸

³⁶ Id.

³⁷ Id; *Code Rural*, Art. L. 642-23 to 642-25.

³⁸ ODGs are increasingly adding specifications related to sustainability and environment, in order to boost reputation with consumers. However, some practitioners advise to keep the specifications focused on the production methods and situations that make the product unique.

Control mechanisms

Once the specifications are drafted, the control plan (“*plan de contrôle*”) can be created.³⁹ The control plan is based on the important points of the specifications. It is the basis of verification that a product is actually produced in line with the rules – enabling a consumer to trust that a product is what the label says it is. The types of items controlled for vary by product type and the particulars of the specifications. They can include checking the documentation of harvest dates, confirmation of appropriate storage and drying facilities, and visual inspection of plant and animal variety, for example the breed of cattle used for milk production for cheese products. Other control points include amount of pasture per animal and the density of trees per acre to stay within agreed-upon limits.

There are several levels of control: self-control by the operators, consisting of checks and form filling; internal control by the ODG, which conducts control checks on operators and audits operators’ self-control forms; and external control by a third-party control organization (CO), which conducts control checks of operators in the field, and audits the ODGs’ control regularly (two to four times a year). This inclusion of an independent third-party controller to help draft the control plan and provide inspection services is required by the Rural Code.⁴⁰ The CO will perform surprise visits along the value chain in order to help ensure compliance with the specification.

The INAO mandates a minimum amount of external control, the level of which can vary by sector. However, the remainder of controls can be split between the ODG and the OC in a manner that fits a group’s particular circumstances. A greater amount of internal control will

³⁹ *Code Rural*, L. 642-2. An overview of the principle or most notable control points will also be listed in the specifications documents (*cahier des charges*).

⁴⁰ *Code Rural*, L. 642-27 *et seq.* Additionally, the CO must be approved and overseen by INAO per *Code Rural* L. 642-34 and R. 642-41, and all third party-certification organizations in France are overseen and approved by the *Comité Français d’Accréditation* (COFRAC).

minimize external control needs; this enables those ODGs that have the capacity and resources to manage a larger part of the control, while allowing other ODGs to delegate certain tasks to the third-party CO. The ODG's proposed split of control duties must be approved by the INAO. As an example, one ODG controls 30% of its operators each year, with the CO inspecting 10%. The ODG and CO coordinate to make sure they control different operators in a particular year, and that each operator is inspected relatively frequently.

The control plan also outlines what will be done in the case of non-conformity. There are three levels of non-conformity: minor, major, and severe (“grave.”) Each has different consequences for a particular control point that must be answered by the operator in a different length of time (24 hours for severe, 1 week for major, et cetera). For examples, harvesting the crop before specified dates might be a minor charge where a warning is given, whereas utilizing an unauthorized variety would be a severe issue that, if repeated, could lead to suspension of the use of the ODG's brand for the farmer. Normally, ODG managers and the CO will work to help an operator come back into compliance with the specifications. Sanctions can include excluding the operator from use of the ODG's branding label, but this is rare and nearly always the result of inaction on the operator's part.⁴¹

The costs of third-party certification are usually covered by the ODG, but charged to operators via annual fees (“cotisations”) in order to spread the costs evenly over time, though in some groups the individual operators pay the CO directly when they are controlled.

Defense of intellectual property and brand management

As the name implies, one of the main purposes for the ODG as a collective management organization is to defend the quality sign against fraud and usurpation. Fraudulent use of the sign

⁴¹ Note that the control organizations do not inspect for food safety compliance; it is only for the specification points. However, COs are obliged to report serious food safety issues if they see them.

can occur at two levels—the local/regional level and the larger national or international commerce level. Locally, fraud tends to happen in the form of individual farmers who are not part of the ODG marketing their products using the quality sign name brand or logo, often at farmer’s markets, local shops, or at roadside stands. Most ODGs that we interviewed have these issues with some frequency,⁴² and managers will talk to the farmer or send a cease-and-desist letter. Usually such action is sufficient, but if not, ODGs can get the INAO involved, or even file an action at the local court.

At the extra-regional or foreign level, the reputation that an ODG develops can lead outside businesses to infringe on the name. When this occurs, ODGs can work with INAO and the French consumer fraud authority, DGCCRF,⁴³ which can provide assistance and legal support.⁴⁴ Most ODGs do not get involved with litigation frequently, but when it does occur INAO provides substantial support, including sharing the costs of legal services.⁴⁵

ODGs carry out a variety of promotional activities for the quality sign, with some being more involved with marketing and promotion efforts than others. ODGs promote their quality sign brand in a general way, rather than particular products of their individual members (ODGs do not buy, sell, or otherwise commercialize quality sign products themselves; more on this in the “Legal Requirements” section below). Managers often attend regional food fairs and *salons* where they can educate people about their production practices and hand out promotional materials. Some

⁴² Ideally, all the farmers in a particular region will eventually begin to produce under the specifications and become official members of the ODG, especially with the regionally-oriented AOP/PDO and PGI programs. This 100% saturation can happen as an ODG develops its reputation, gains sales, and adds producers over time.

⁴³ *Direction Générale de la Concurrence, de la Consommation et de la Repression des Frauds*

⁴⁴ The INAO has authority to take action/litigate based on France’s intellectual property code (*Code de la propriété intellectuelle*) whereas the DGCCRF takes action based on the consumer code (*Code de la consommation*).

⁴⁵ Quote from an INAO agent: “If we observe that someone is doing this, we can... not necessarily take them to court straight away, it generally starts with official letters, but it can end up in court if there’s no other way of finding a solution. In that case, we have lawyers who support the ODG. And the cost – because lawyers aren’t free! – is shared between the ODG and the INAO.”

ODGs are involved with agri-tourism, setting up farm visit days with maps of farmer stops on a trail or around a region, as well as supermarket promotions, usually within the relevant farming region. However, some of the larger volume ODGs have initiated media campaigns, such as advertisements in the Paris Metro. ODGs often receive subsidies from the EU or regional French authorities, which in some cases can be used for programming by cooperatives, or other businesses that do the more direct marketing of the products.

Legal requirements

The definition and main legal requirements for quality sign programs and ODGs are outlined in Book Six, Title IV of the French Rural code.⁴⁶ However, multiple areas of the law apply to ODG functioning, in particular French corporate and nonprofit law and the French Intellectual Property code related to trademarks and geographical indications.⁴⁷ This subsection *B* will focus on the specific laws and regulations that help to shape and define ODGs.⁴⁸

Entity considerations and membership definitions

A very important aspect of ODGs is that they must not have a commercial purpose, meaning that they do not buy, sell, or themselves produce the goods they manage.⁴⁹ Because of this, only certain forms of business entities are permitted for organizing an ODG,⁵⁰ namely,

⁴⁶ *La valorization des produits agricoles, forestiers ou alimentaires et des produits de la mer: Code Rural*, L. 640-1 to 644-15 & R. 641-1 to D. 646-37.

⁴⁷ Trademark laws are similar in France and the U.S., but geographical indications have a separate legal regime in France, found in the *Code de la propriété intellectuelle* L. 721-1 to 722-17 & R. 721-1 to 722-7.

⁴⁸ Many of the main requirements for ODGs are spelled out in Chapter II, Section III of Title IV (*Code Rural* L. 642-17 to 642-26 & R. 642-33 to 642-36), called *Les organismes de défense et de gestion*.

⁴⁹ This admonition against commercial purpose, while not found in French codes or accessible regulations, is detailed in the INAO's guidance publication for ODGs ("Guide du demandeur pour la reconnaissance en qualité d'organisme de défense et de gestion.") It was also mentioned and emphasized by multiple INAO agents and other interviewees officially connected to the INAO. For this reason, it is either a *de facto* regulation, or, we hypothesize, a *per se* regulation codified in an INAO *Circulaire* not publicly accessible.

⁵⁰ *Guide du demandeur pour la reconnaissance en qualité d'organisme de défense et de gestion*, INAO, Avril 2017.

“syndicates”⁵¹ (farmer’s unions), or associations organized under the *Loi du 1^{er} juillet 1901*,⁵² the main nonprofit law used in France.⁵³ For-profit corporations and cooperatives are prohibited from use due to their commercial nature, though certain “interprofessions” organized prior to 2007 can be approved to act as ODGs, provided they split their ODG missions and finances from their other activities.⁵⁴ While a baseline business entity must be used to organize an ODG, we posit that the ODG form can be considered as a “quasi”-business entity due to the statutory and regulatory requirements that apply to the form. ODGs can manage more than one quality product,⁵⁵ for example a poultry ODG might manage different quality signs for chicken, duck, and eggs that its farmers raise.

The flexible if complicated French legal platform for ODGs gives all the relevant value chain actors implicated by the production rules the power to get involved. ODGs can involve farmers, packers, processors, slaughterhouses, and potentially other upstream and downstream actors, collectively defined as “operators.” The Rural Code, in seeking to ensure that all relevant producers have a voice in decisionmaking about the production rules, define an operator as “... each person⁵⁶ that actually participates in the activities of production, transformation, processing, or packing planned for in the production specifications ...”⁵⁷ (translation by first author). In other words, any actor who is involved in a production step outlined by the production rules is an operator and has certain rights and obligations under the Rural Code.

⁵¹ Syndicates are organized under the French labor code, *Code de Travail*, L. 2131-1 to L. 2131-6; R. 2131-1 requires a syndicate to file their statutes at the local Mayor’s office.

⁵² This association law, *Loi du 1^{er} juillet 1901*, is an important standalone law that has not been incorporated into a business code but is instead regulated by the law of contracts (*Loi du 1^{er} juillet 1901*, Art. 1^{er}). Associations must file their statutes at the local Prefecture, found at the head of the department (akin to a county seat in the United States; there are 101 departments in France). Statutes are publicly available by request, but not online.

⁵³ However, ODGs are not charitable organizations.

⁵⁴ *Code Rural*, L. 642-19.

⁵⁵ *Code Rural*, L. 642-17.

⁵⁶ Similar to Michigan/United States law, e.g. MCL 450.2108, “persons” can include corporations and other legal entities.

⁵⁷ *Code Rural*, L. 642-3.

Operators are deemed to be members of the ODG as a matter of law,⁵⁸ but membership in the underlying entity – the association or syndicate – can be further defined in their organizational documents, following laws applicable to that entity.⁵⁹ Operators can be represented by delegates, provided there is some democratic mechanism for selection of delegates and that the operators are kept informed about ODG matters.⁶⁰ In some ODGs, for example, cooperatives are the main members, but this is acceptable because the farmer operators are involved in the democratic processes at the cooperative level. However, ODGs must provide a means for individual operators to become part of the ODG, for example farmers that are not members of a member cooperative.⁶¹

Financing

Regarding financing, an ODG is free to determine how to calculate a fee structure for the funding of its activities. Sometimes these fees (*cotisations*) will be flat, but they are often calculated on a per-unit basis. The decision to set fee levels must be decided on annually by the General Assembly, which is the whole body of the members, and the details of this vote must be provided to the INAO.⁶² This provides the operators a direct vote on the fees as a matter of law, ensuring a small board of directors cannot control the financial decisions affecting all the operators. Operators are obligated to provide the information necessary to calculate their fees to the ODG,⁶³ though in some situations not all operators in an ODG are necessarily liable to pay the fees, for example where a cooperative pays on a farmer's behalf.

⁵⁸ *Code Rural*, L. 642-21.

⁵⁹ For example, the groups statutes might require the annual fees to be paid as a condition or confirmation of membership.

⁶⁰ *Guide du demandeur pour la reconnaissance en qualité d'organisme de défense et de gestion*, INAO, Avril 2017.

⁶¹ *Id.*

⁶² *Code Rural*, L. 642-24.

⁶³ *Id.*

Organizational documents and structural requirements

The basic fee structure, details on membership, and missions are all set forth in the ODGs “statutes” and “*reglèment intérieur*,” which are organizational documents similar to corporate articles of incorporation and bylaws in the United States.⁶⁴ In order to apply for recognition as an ODG, the group must provide their statutes (and *reglèment intérieur* if they have one) to the INAO for approval.⁶⁵ Groups have a high degree of flexibility with how to structure the ODG, but among other things, INAO checks to see if the relationship between the operators passes scrutiny regarding three statutory and regulatory factors:

- representativeness of the operators (*représentativité des opérateurs*)⁶⁶
- equality of representation (*représentation équilibrée*)⁶⁷
- democratic functioning (*fonctionnement démocratique*)⁶⁸

These factors, detailed below, broadly seek to implement fairness, which is a concept that is perhaps uniquely operationalized in various areas of French law including contracts.⁶⁹ Overall, deference is given to the group organizing the ODG, but INAO outreach agents and National

⁶⁴ An organization’s *statutes* contain many of the operational rules concerning membership and the board of directors, *inter alia*, that would be contained in bylaws in the U.S. However, while bylaws in the U.S. are a private document, the statutes are a semi-public document, accessible by the general public, but only upon request (not held online like articles of incorporation can be in the U.S.). As such, the statutes are somewhat of a cross between articles and bylaws. The *reglèment intérieur* is a private document, however, which can add more specifics and rules to the statutes but cannot contradict the statutes on any matters. A *reglèment intérieur* is optional – many ODGs do not have one.

⁶⁵ *Code Rural*, R. 642-33.

⁶⁶ *Code Rural*, L. 642-18; INAO-DIR-2009-03 rév.1.

⁶⁷ *Id.*

⁶⁸ INAO-DIR-2009-03 rév.1.

⁶⁹ For examples, see *Code Civil*, Art. 1171, deeming certain side-clauses that create a “significant imbalance” between parties to be “unwritten” (essentially non-enforceable); *Code Civil*, Art. 1195, allowing a judge to revise a contract when unforeseen circumstances make it onerously costly for a party to perform; and *Code Civil*, Art. 1221, allowing specific performance unless it would be extraordinarily costly to the obliged. Fairness is a concept incorporated into contract law in United States as well, but the French mechanisms seem to provide stronger safeguards against greatly disadvantageous outcomes.

Committee members⁷⁰ (more on these below) check to ensure that the power relationship between actors is not too out of balance.

The factor of representativeness of operators relates to the basic rule that all operators potentially implicated by the ODG's product specifications must have a voice. To assess this, INAO agents work to determine how many operators are involved with the ODG relative to the total number of operators currently working in the production of that product, as well as the volume of product the group organizing the ODG produce relative to the whole.⁷¹ For example, the organizers of an ODG for a GI identifying a particular variety of pears should make sure that at least 80% of the growers of that variety in that region are represented and involved in the discussions, and similarly that most of the volume of production is represented. In this way, an ODG should mirror fairly closely the extant industry, so that the ODG does not become an exclusive club.⁷² In a practical sense, this does not mean all operators will participate in the ODGs production rules from the start. Often the membership grows once the ODG is more established and the operators involved experience more benefits, with some PGI and PDO ODGs eventually adding all the farmers from the region onto its membership list.

There are some scholars, however, who question the value of representativeness, noting that this requirement can duplicate already-existing inequalities or unfair situations between ODG actors (Marie-Vivian, Carimentrand, et al., 2019). For example, a group of smaller cheese producers might seek a quality sign for their products that requires the use of certain artisanal

⁷⁰ The Rural Code creates several national committees to provide oversight of quality sign programs and approve applications for ODG status; see *Code Rural*, L. 642-6 to 642-11.

⁷¹ *Guide du demandeur pour la reconnaissance en qualité d'organisme de défense et de gestion*, INAO, Avril 2017.

⁷² In the case of GIs, a delineated region is created, and all growers inside that region are implicated. However, the rules of Label Rouge allow for farmers or other food producers to create a product that is different from the standard, without regional constriction and reputational history, and so some Label Rouge ODGs illustrate exceptions to this rule. For example, several producers of a new, special variety of wheat could work together, potentially span different regions, provided they create a collective (ODG) that enables other producers that comply with the product specifications to join.

practices, but representativeness enables larger companies of cheese in their area to enter the ODG and water down the rules. In this way, the reputation that may have been built by artisanal producers over many years can become exploited by processors working with essentially commodity milk.

The factor of democratic functioning requires there to be democratic processes underlying all important decisions for the ODG. All operators must be able to have a voice individually or to elect members through some democratic mechanism.⁷³ This means that even though farmers are operators in an ODG, cooperatives can be *per se* members and vote in the General Assembly because there is a method for electing the delegates through the cooperative.

ODGs can organize different classes of operators into colleges or sections.⁷⁴ This enables the different classes to have representation on the board of directors (*conseil*), which provides flexible structuring that can fit nearly any value chain situation and number of operators. Some ODGs may have hundreds of farmers, multiple processors, and a college of farmers that process on farm, whereas more simple ODGs have only farmers as members. As such, the ODG model can allow for significant complexity, as opposed to the cooperative form, which for example is normally more limited to one member, one vote, and single levels of membership even between different product areas (though capital contributions can vary). Democratic functioning in an ODG is not limited to one member, one vote, and structures where the downstream actors (e.g. processors, slaughterhouses) have as many board seats as the upstream operators (e.g. farmers) are not uncommon and are found to be acceptable by INAO.

⁷³ *Guide du demandeur pour la reconnaissance en qualité d'organisme de défense et de gestion*, INAO, Avril 2017.

⁷⁴ *Id.*

Importantly, it is up to the ODG to spell out the process and the body that is charged with creating the product specifications.⁷⁵ Although the structure must be approved by INAO which presumably ensures that the voices of the operators are heard, the process of product rule creation can be delegated to the board. While this surely adds practicality to the development of the production rules, there is a risk of decisionmaking being skewed towards more concentrated actors such as cooperatives and processors, even if those results are ratified at the General Assembly of operators.

The factor of balanced representation relates to the different categories of the operators along the value chain that are involved.⁷⁶ While this factor is ostensibly meant to ensure that farmers have significant voice, this principle goes both ways, also requiring that there be representation from the processors, packers, and other downstream operators involved. This factor is closely tied to the representativeness and democratic functioning of an ODG. What is considered to be balanced representation can vary widely, again with deference usually given to the ODG. INAO will step in when they determine there is a significant imbalance or lopsidedness, such as a situation where a small number of downstream operators hold a clear majority of the decisionmaking power.

Institutional support and oversight

Two significant areas of support for ODGs are found with the application process, including applications for changes to existing production rules, and with subsidies of various types that help save resources for ODGs.

⁷⁵ *Id.*

⁷⁶ *Id.*

Application process and continuing oversight

The INAO is main supporting organization for ODG development and ongoing changes with production specifications, with approximately 18 local INAO agents serving the different French regions. Interested groups will come to these agents for information and guidance on the process. Three important areas for which INAO agents provide support and oversight are the development of the ODG organizational structure, the development or modification of specifications, and communications with the INAO National Committee that ultimately decides on the ODGs application.

The organizational structure is of first order importance because it is the ODG that creates the specifications via a democratic process; therefore, it is important to ensure that the appropriate stakeholders have a voice and a sufficient level of voting power in the ODG. To accomplish this, when working with a new group INAO will evaluate whether the appropriate stakeholders are involved in the process, per the *représentativité* or representativeness factor mentioned above. Usually, local agents already have familiarity with the sector involved but will also go to the local Chamber of Agriculture to cross reference information given to them by the ODG organizers regarding the volume of product and percentage of the implicated operators they represent. To help institute the factors of *fonctionnement démocratique* and *représentation équilibrée*, INAO agents can provide advice to groups on the internal structure during the development of their *statutes*,⁷⁷ with some agents being more involved in statute development than others. Groups are encouraged to connect with existing ODGs to gather experience and examples of statutes that can help them create their organizational structures. Industry groups and cooperatives also help with statutes

⁷⁷ As mentioned above, the *statutes* are similar to bylaws in the U.S., setting out provisions for the governance structure for the organization (e.g. board membership and voting rules). The statutes document is the main organizational document for ODGs and many other corporate organizations.

development in some circumstances. Local INAO agents can send difficult questions regarding the statutes or internal structure on to the legal department at the central INAO office in Paris for opinion. Overall, INAO agents guide groups in creating a structure that will pass the scrutiny of the INAO National Committee.

As the production rules or specifications are being written by the ODG, INAO agents provide expertise on items that should be included (or alternatively, excluded). Agents advise groups to consider the corresponding control measure for any item that will be included in the specifications, as control measures are based on important points in the specifications. University or government research units might provide assistance on an ad hoc basis with writing specifications, for example by providing help with defining the product. Also, agents from control organizations (COs) will advise groups on specifications and items to consider for the control plan if they are able to connect early on with an ODG.

Where specifications involve defining areas of production, as with PDOs and PGIs, INAO will provide experts to help delimit and define the areas, including geographers. These definitions will eventually become part of the specifications.

Once an ODG's dossier is ready, it is sent to the appropriate INAO National Committee, which oversees and approves applications both for new quality signs and for modifications to an existing quality sign's specifications. The National Committee structure is an important institutional pillar for the French quality sign programs, providing a clear decisionmaking process for recognition of products and oversight to ODGs.⁷⁸ The appropriate committee will look at the ODG's statutes (and *règlement intérieur* if the group has one) to ensure it complies with the Rural Code requirements for structure. The committee will also review and comment on the

⁷⁸ See *Code Rural*, L. 642-6 to 642-11, which establishes the INAO National Committee structure.

specifications or modification of the specifications. The French fraud and consumer protection agency (DGCCRF) is part of the committee process and can provide ODGs input on labelling and other items on behalf of consumers.

The regional INAO agents serve as liaisons for ODGs at the National Committee meetings. After helping a group to prepare their dossier for committee approval, the local agent will attend the meetings (held in Paris) in order to explain the ODG's case, acting both as an advocate for the ODG and as a communication messenger from the National Committee to the ODG.

The process of quality sign development can be quite long, with final approval taking anywhere from two years to longer than a decade. It can take four or more years to make seemingly simple modifications of the production rules. This is perhaps both a weakness and a strength of the quality sign programs – while practical amendments related to technological advances require an onerous process, consumers are essentially provided a higher guarantee that the level of quality will not be eroded. INAO has a policy to not approve any change in specifications that will have a negative impact on the quality of the product, however it is debatable whether this has been adhered to in certain cases (Marie-Vivian, Carimentrand, et al., 2019).⁷⁹

Once approved, local INAO agents will continue to work with and provide oversight to ODGs. They are invited to the General Assembly meetings, where they can confirm the voting process for annual fees required by law. ODGs are required to annually submit to the local INAO agents the minutes of the General Assembly meetings and a current list of operators. Local agents are normally in frequent communication with ODGs because they regularly seek to make

⁷⁹ For example, in one cheese group, the rules were changed to allow pasteurized milk to be used to make the cheese, enabling much larger farmers to enter the ODG and produce large volumes of cheese, but damaging the reputation of the quality sign and putting downward pressure on quality: see Marie-Vivien, D., Carimentrand, A., Fournier, S., Cerdan, C., & Sautier, D. (2019). Controversies around geographical indications: Are democracy and representativeness the solution? *British Food Journal*, 121(12), 2995-3010 (pages 3001 to 3002).

modifications to the production rules, including sometimes minor changes such as storage container size.

Defense and marketing support and other subsidies

While there is little direct government aid for farmers to adopt quality label production, ODGs and quality signs are supported in a variety of ways. Common agricultural subsidies and farm aid from the EU and France can help farmers to get started with quality sign production as with other types of production.⁸⁰ In some cases regional authorities help farmers in these systems, for example to make equipment purchases relevant to the region's production. Regional bodies, such as the Chamber of Agriculture, sometimes provide office space and other office support for ODGs. Cooperatives often have their programs for new farmers, who might be edged towards quality signs as viable avenues of production. However, in most cases it seems to be price premium or reputational edge that quality signs provide that attracts farmers to work with ODGs in their area.⁸¹

One of the most important areas of support at the level of the ODG is assistance with defense. As mentioned above, ODGs can write cease and desist letters to people inside and outside their region based on the intellectual property they have been granted in the form of a quality sign. However, when that isn't effective, the ODG can ask INAO to send a cease and desist letter, which is backed up by threat of litigation – INAO will share the legal costs with groups. It would be impossible to quantify the value of having a government agency backing up an ODG's intellectual property, but in addition to staff time and the sharing of lawyer's fees that occur from time to time

⁸⁰ For example, the EU has subsidized 50% or more of the cost of tree plantings in certain areas, and for certain varieties – but these are not limited to quality sign varieties.

⁸¹ As stated by one ODG manager: "Objectively speaking, it's not the subsidies that incite farmers to produce. ... What does encourage them is the added value of having a Label Rouge [product] in relation to standard production." – *quote translated from French.*

in higher profile cases, many infringers are doubtlessly deterred by INAO's cease and desist letters at the outset.

Another area where ODGs garner a significant amount of support is promotion. The EU regularly provides funding that can be used for building reputation for an ODG's products. The amounts can represent a significant percentage of an ODG's marketing budget and provide money for advertisements on, for one example, national radio spots. Regional authorities also provide substantial support to ODGs, for promotion of the brand and of the products in association with the region.

In closing this section, it should be emphasized that one of the largest sources of support, which saves substantial ODG resources, is the INAO itself. This institutional framework provides groups a starting point and assistance that would normally have to be undertaken by an entrepreneur, and in an ad-hoc manner that would likely be less efficient without tested models and processes to adopt. Salient to the topic of marketing supports, INAO agents help with development and oversight using programmatic rules that serve to keep a high level of quality for the products. The umbrella nature of the quality sign labels (Label Rouge, PGI, PDO/AOC) creates a framework that significantly lowers the cost of developing reputation for a group, because of the existing recognition and credibility of the label.

ORGANIZATION OF THE ODG MODE IN THE UNITED STATES

The central aspect of this model – the development of production specifications and the management of resulting intellectual property – can be accomplished using existing state-level law. Here we use Michigan as the example state legal system and statutory regime. However, there are several important aspects of the French model that would require modifications or special

provisions to be put into the organizational documents. Furthermore, there are many benefits stemming from the quality sign programs and other French institutional supports that would require the development of oversight mechanisms. This paper will visit each of these levels in turn.

Establishing the core purpose of development and management of specifications

Creating an organization that replicated the core purpose of the ODG model in the United States would be relatively simple. However, steps need to be taken in order to ensure compliance with anti-trust laws.

In Michigan, the most appropriate entity to use would be a nonprofit association created under the Nonprofit Corporation Act.⁸² This act can be used to create a wide range of nonprofit businesses.⁸³ By electing to use a nonstock, membership structure, the group can create an appropriate structure based on the circumstances and the value chain actors involved.⁸⁴ The organization can be managed on a one member, one vote basis, which is the default basis provided in the law,⁸⁵ or different classes of members can be given different voting rights.⁸⁶ For example, this would allow for operators to be organized into colleges, each of which has a defined level of representation on the board of directors.

It is necessary to elaborate the basic purposes for the organization in the articles of incorporation.⁸⁷ While this statement can be somewhat broad (e.g. “...organized for the purpose of branding agricultural products,”) it may be prudent to narrow to the main purposes of the ODG mode in order to help clarify the non-commercial nature of the organization: the purpose of the

⁸² MCL 450.2101 et seq.

⁸³ These include nonprofit cooperatives. However, due to the commercial nature of the cooperative form, even a nonprofit cooperative would not be appropriate for the ODG mode, particularly if value chain actors other than farmers will be involved, due to anti-trust concerns.

⁸⁴ MCL 450.2302; MCL 450.2304

⁸⁵ MCL 450.2304(3).

⁸⁶ MCL 450.2304(2).

⁸⁷ MCL 450.2202(b).

organization is to create of production standards, develop of intellectual property and branding, and promote and defend the brand. While non-commercial, an ODG-mode business is not a charitable organization and therefore would not qualify as a 501(c)3 organization for federal income tax purposes.⁸⁸

A nonprofit association that has value chain actors other than farmers for members will not be exempt from anti-trust regulations under the Capper-Volstead act,^{89,90} making it important to ensure that members are not using the organization to engage in any sort of price setting. Provisions should be included in the articles of incorporation that prohibit real time price fixing or quantity coordination across members. The bylaws should also have a provision that explicitly prohibits discussions regarding prices or efforts to affect quantity at all meetings of the organization. French ODGs similarly comply with anti-trust laws by not engaging in commercial activities and by not allowing members to use ODG meetings and venues to discuss price.

In regard to anti-trust and competition law, however, it is sometimes argued that certain production specifications can ultimately affect quantity (directly or indirectly). A full analysis of related French and EU anti-trust jurisprudence is outside of the scope of this article,⁹¹ but whereas production rules that would provide direct constraints on quality such as limiting the amount of acreage or limitations to entry of new participants might work in France or the EU, such product specifications should be avoided in the United States until/unless there is clear legislation and/or case law enabling them to be used, or unless there is an applicable legal exemption that a group is

⁸⁸ 26 U.S.C. § 501. However, an ODG-mode business organized as a Michigan nonprofit corporation might qualify as a 506(c)6 trade association.

⁸⁹ 7 U.S.C. §§ 291 to 292.

⁹⁰ An exception is organizations managing federal and state marketing orders, which can include processors in addition to farmers; they are exempt as a result of the Agricultural Marketing Act of 1937 (see 7 U.S.C. § 608(b)).

⁹¹ For more on this topic, see Raynaud, E., & Valceschini, E. (2005). Collectif ou collusif?. *Revue internationale de droit économique*, 19(2), 165-195; Marette, S., & Raynaud, E. (2003). Applications du droit de la concurrence au secteur agroalimentaire. *Économie rurale*, 277(1), 9-22; Raynaud, E., & Egizio, V. (1997). *Competition regulation against quality policy: the «Label Rouge» in the French Poultry Industry* (No. 729-2016-50546, pp. 529-546).

working under (for example, a federal marketing order.)⁹² Production rules that are established in order to develop a particular quality of product, such as geographical origin, varietal or genetic selection, or grading and uniformity rules, do not directly limit quantity and should be safe from an anti-trust perspective.⁹³ Similarly, production rules that focus on conservation or other sustainable practices should also be allowable, given that third-party certifications, ecolabels, and food safety rules are widely adopted across farmers without issue, even if these rules have (usually limited) indirect consequences on quantity. However, I add the caveat that such quality-oriented production rules must not be used as an artifice for quantity limitation; this ODG mode would not protect a group or industry from anti-trust actions in such a situation (Monica, 2017).

Incorporating other benefits resulting from French law

An organization in the United States seeking to replicate the multiple aspects of fairness prescribed in French law can do so by adding specific provisions to their organizational documents. One of the central tenets of the French quality sign programs is accessibility to the ODG and the resulting brand. All farmers and other actors that comply with the rules should be able to join the ODG, have some level of voice in the decisionmaking, and utilize the brand or quality sign resulting from the work. To accomplish this using a nonprofit association in the U.S., provisions related to the concept of operators need to be included. “Operators” can be defined as all persons, natural and legal, that are involved in any step of product production that is specifically outlined

⁹² Limitations to acreage have been used as a cause of action in the United States. See Monica Jr, J. C. (2017). Agricultural Antitrust Liability: What about the Reasonable Farmer. *Drake J. Agric. L.*, 22, 1.

⁹³ While price leads anti-trust discussion, quality is also a metric that is considered in anti-trust actions. See, for example, OECD. (2013). The role and measurement of quality in competition analysis. *OECD Policy Roundtables*. The United State’s brief for the OECD roundtable quotes the U.S. Supreme Court: “The antitrust laws do not require manufacturers to produce generic goods that consumers do not know about or want. The manufacturer strives to improve its product quality or to promote its brand because it believes this conduct will lead to increased demand despite higher prices. ...” *Leegin Creative Leather Prods., Inc. v. PSKS, Inc.*, 551 U.S. 877, 897 (2007), at 2719.

by the production rules. This means that a processor that uses a specific process or ingredient outlined in the production rules would be considered an operator, whereas a distribution company that simply buys, transports, and sells the product to retailers would not. A bylaw giving operators the right to have input and voice in the organization should be included, as well as one providing the right to use the resulting brand if the operator is in compliance with the specifications.⁹⁴

Other important fairness aspects of the ODG mode include representativeness of the operators, democratic functioning, and equality of representation. The first of these, representativeness, relates to the existing industry for a product. In France, a majority of the quality signs related to geographic areas, so that a quality sign under the PGI or PDO/AOC programs will necessarily implicate the entire industry in that area. This provides significant public policy justification for the ensuring that the industry is well-represented during the ODG development process. Other quality products, including some having Label Rouge status, are not necessarily from a defined region but often arose from already existing production systems. When developing an organization following the ODG mode in the United States, however, the factor of representativeness may not be necessary or desired in many circumstances, such as for the development of new products, or when a product is intended to be marketed for its higher quality or special production rules. For example, a farmer group that wanted to work together to grow a specific variety of potato such as fingerlings would not need to involve all of the potato farmers in the state in the development of their organization. However, for a quality product based on a geography and its existing reputation, representativeness would be appropriate. Having no

⁹⁴ Note that it is not necessarily the case that all operators need to be fee-paying members in order to enjoy these rights. A provision in French law (*Code Rural*, L. 642-21) establishes that all operators are members, but this may in fact be in opposition to certain EU public policies as well as impracticable in certain contexts (Delphine Marie-Vivian, personal comment). See generally Marie-Vivien, D., Carimentrand, A., Fournier, S., Cerdan, C., & Sautier, D. (2019). Controversies around geographical indications: Are democracy and representativeness the solution? *British Food Journal*, 121(12), 2995-3010.

overarching institutional structure in the U.S., these decisions would be made in an *ad hoc* manner by the organizers.⁹⁵

A group can implement the factors of equality of representation and democratic functioning by creating provisions related to voting rights and board representation that seek to provide an appropriate balance of power between the actors involved. The characteristics of a fair structure will vary based on the circumstances of the operators and their production. Consideration of the amount of input by the different categories of actors should be made, for example whether most of the work that adds value is done by farmers, processors, or other relevant actors. Representative equality can be implemented by providing decisionmaking weight to the different categories of actors based on the amounts of production rules and responsibility that falls on each of them, for example by allocation of board seats. However, to ascertain this it is important for the organizers to create a process for gathering input from all of the relevant operators involved. Otherwise, operators not sufficiently included or heard can become disenfranchised, which may lead to declining quality.

Replicating institutional supports

Developing a governmental institutional framework similar to the INAO would likely be extraordinarily costly and politically infeasible, but many of the strengths of the French institutional arrangement could feasibly be replicated using private organizations, and potentially some level of public support. Three main areas emerge: development support, quality sign programming, and defense. Each of these are detailed separately below, although they also intersect with each other.

⁹⁵ However, if an umbrella brand or oversight program is created as an institutional support (see Part II, Section C) might consider representativeness as a required factor depending on the purposes of their program.

Development supports

One of the biggest strengths of the French system is the existence of INAO agents, who provide some level of assistance during the development process.⁹⁶ These agents work with farmers in a similar manner as university agricultural extension agents in the United States, developing expertise in the area of farm business outreach over their careers. Similarly, there are cooperative development centers that provide educational outreach, training, and business development advice in the United States. These are often associated with land grant universities and work in partnership with university extension agents.

If similar programming around the ODG mode was developed using these existing land grant resources or via a private organization, only a handful of agents would be needed to provide significant outreach, education, and developmental assistance to groups organizing as ODGs. For example, if a government program similar to cooperative development were created, training could focus with as few staff members as one agent per business development center, or one extension agent per state.⁹⁷

Agents with ODG mode expertise can help groups with the organizational process, ensuring that the right actors are involved and providing assistance developing bylaws and production rules. During the development process, agents can work to ensure the principles of equality of representation, democratic functioning, and, where appropriate, representativeness of the extant industry. Agents can also recommend adoption of the principle that all operators who

⁹⁶ Interviews conducted with the French international development agency CIRAD identified this type of expertise as being one of the most desired, potentially beneficial institutional supports for work in developing countries. See also Marie-Vivien, D., & Biénabe, E. (2017). The multifaceted role of the state in the protection of geographical indications: A worldwide review. *World Development*, 98, 1-11.

⁹⁷ On the private side, a relevant example can be found with Cooperative Development Services, which provides consulting services for food cooperatives around the United States. They have several experts who travel to conduct feasibility studies and other food cooperative business development work; however, these agents have developed a specialized expertise that is indispensable.

comply with the rules are eligible to join the quality sign organization and use the resulting brand, if that matches the policies promoted by the agents' institutions.

Quality sign programming

Development of a quality sign program at the state level is possible in the United States, but funding and other issues may present significant obstacles that are not feasible to overcome in most states. However, it is possible that a private organization could be developed at to create an umbrella brand for groups of producers to develop products under. While a full assessment of the topic of organizing an umbrella organization is outside the scope of this study, in this subsection I will visit a few of the key structural aspects needed to replicate important benefits of the French quality sign programs.

A quality sign umbrella organization could develop rules to help shape the ODG-mode organizations and to provide ongoing oversight. It may be beneficial to create a baseline set of standards, such as minimum animal welfare and sustainability practices, that can apply across products.⁹⁸ The organization could limit the program to a particular geographical area, such as a region within Michigan, or a wider foodshed such as the Great Lakes. However, any umbrella brand organization would need to define what is different about its products and require groups to define the specificities of their products. In a practical sense, the success of the brand might rest on having higher intrinsic levels of quality, in addition to any other qualities such as geography or being grown with sustainable practices.

Once the main rules have been developed, this umbrella organization can develop logos and apply for a certification mark or a collective mark (both marks are types of trademarks) that

⁹⁸ The Label Rouge program in France has baseline production rules for a variety of product types, for example, beef, poultry and lamb. Groups seeking the Label Rouge quality sign must meet these rules at a minimum, and also create their own specific standards in order to develop a unique product.

would become the basis for a branding program. The organization would allow ODG-type farmer groups that comply with its rules to use the resulting logo for branding.

Such an umbrella organization will want to keep its standards high in order to develop its reputation and establish credibility. A significant amount of strength and detail of control is mandated for the French quality sign programs in order to ensure a high level of integrity and that the signs and products can withstand scrutiny of policymakers and the consuming public. This justifies the use of third-party certification organizations. However, the level of control needed for an umbrella label in the United States could vary. For some efforts, third-party certification might be prudent to help provide legitimacy of the brand and program, whereas for others, such as where consumer trust is high, control checks could be carried out by the umbrella brand itself.

Developing capital for such an umbrella brand effort would present a substantial challenge. Due to the large amount of up-front funding that would be needed to help with the establishment and organization of the ODG-type production groups, as well as the resources for the promotion and advertising needed to successfully develop brand recognition in early years, an investment fund might be critical to the feasibility of the effort. The purpose of developing branding for farmers is not generally charitable (unless it is tied to another charitable purpose such as helping underserved communities,) and for this reason, the involvement or creation of a community development financial institution (CDFI) to create a funding pool may be unlikely to work. However, there are alternatives CDFIs. Standard venture capital groups are unlikely to work either, because the venture capitalists will likely want some say in the programmatic rule development in order to allow flexibility to adjust to the market. However, this desire would be in direct opposition to the rigidity of standards needed for long-term brand development needed. Additionally, venture capitalists will likely demand relatively high rates of returns to their investment. One potential

possibility is to utilize a Benefit Corporation, a burgeoning type of social-entrepreneurship entity, to garner investment from socially-minded individuals and impact investors who are interested in regional food system development. These investors can be willing to take a lower rate of return (Roundy et al., 2017), and a Benefit Corporation can be used to ensure that the original purposes of the corporation (developing regional branding for farmers) are adhered to even if it is less profitable than other ventures. However, the corporation would have to deal with securities registration and subsequent advertising of investment opportunities.

If an umbrella organization manages to overcome these funding and brand development challenges and eventually gets to the point where it is running smoothly with numerous member groups and products, the organization could potentially be used to provide the expert agents mentioned in the subsection above. Per unit fees can be used as a sustainable source of funding for those agents and other operational needs, if price premiums and increased sales volumes make these fees economically feasible to charge operators. The Label Rouge program is funded in part in this manner.⁹⁹

Defense

ODGs in France enjoy a significant benefit in the form of government aid with defense of intellectual property. Both the sending of cease and desist letters and assistance with litigation by INAO act as deterrents to domestic and foreign usurpation and provide support to ODGs in their defense efforts.

Similar support for intellectual property defense could be provided, to some extent or another, by an umbrella brand organization. An umbrella organization could centralize defense activities for each of its groups' products, writing cease and desist letters and initiating the

⁹⁹ *Code Rural*, L. 642-13.

enforcement of US intellectual property laws where necessary. Template cease and desist letters could be drafted and used for different circumstances (for examples local farmer usurpation in direct markets, infringement of the logo or brand name by an outside business.) If an umbrella organization is successful financially, per unit fees could be collected from groups to use for defense of the brand in courts when necessary. Such costs of litigation and/or mediation can be substantial.

State departments of agriculture (e.g. Michigan Department of Agriculture and Rural Development) provide another possibility. A single group or an umbrella could negotiate an arrangement to provide aid with defense efforts. Such a relationship with a state's agriculture department could be mutually beneficial, protection the reputation of both the quality sign organization and the state's agricultural sector, especially if the umbrella organization uses state or an internal region geography as part of the label. This would likely require some sort of legislation, which might be more feasible if it were applicable to other agricultural groups based in the state (for example if the Michigan Apple Committee could also request state assistance if their label is being infringed upon.) Cease and desist letters written by the state would be a relatively low-cost method of meeting these mutual goals,¹⁰⁰ and in a best-case scenario, assistance with funding the costs of litigation by the state could be provided.

APPROPRIATENESS OF THE ODG MODE FOR DIFFERENT CONTEXTS

The utility of the ODG mode of organization will vary based on the particular circumstances of a value chain or producer group. Here we consider the “fit” of the ODG for

¹⁰⁰ After the initial development of a template cease and desist letter form, I estimate about two to four hours of MDARD staff time would be needed, between communication about the issue with the stakeholder group representative and writing and sending the letter..

various contexts in the United States, and conversely situations where the ODG mode would likely not be an appropriate fit.

More ideal contexts for the ODG mode

The ODG mode has many strengths as an organizational tool and may be beneficial for groups to use under certain circumstances. As with any value-added food production effort, it is necessary to have a strong customer base and market for the group's products, whether that is achieved through local proximity, shortness of supply chain, or access to a wide geography using conventional distribution channels. Additionally, the group of farmers must be amenable to cooperation. Below is a list of circumstances where the ODG model would have a more ideal fit:

1. Where groups of farmers want to work in common on branding a value-added product. The branding could be intended to develop reputation for a specific quality of the product (region, variety, growing process) or could be used for highlighting sustainable practices, or some combination of these criteria. Take, for example, market gardener farmers in southern Michigan, many of whom grow garlic, and use non-certified organic practices. Working with the assumption that many of these farmers have the capacity to grow more garlic, an ODG-mode organization could be started to create rules and develop and manage a brand and logo. Farmers could use this label to signal quality attributes – the chosen variety, sustainable practices, and geography – to direct market and other types of purchasers. As consumer awareness of the label grows through, for example, regular promotion (posters, flyers) used by members during farmers markets across the state, demand for the product could also grow, provided high quality of the product is maintained.

2. Where it would be beneficial to have other value chain actors besides farmers involved (upstream or downstream actors). A strength of the ODG mode is that a variety of value chain

actors can be organized in a manner that does not run in opposition to anti-trust laws. In contrast, cooperatives cannot normally have other value chain actors involved without violating anti-trust laws, due in large part to their commercial nature. One example of a product that would need downstream operators to be involved is Honeycrisp apples from northwest Michigan, which are known to have a higher quality due to their coloration and other factors. In order to market fairly uniform, high quality product, a group of farmers would need to create sizing, coloration, and sucrose content rules for apples to be sold under the label. Only a percentage of regional farmers' Honeycrisps would make the grade, and the equipment facilities needed to do the sorting could run into the tens of millions of dollars. However, many or most apple farmers already work with packers that have this equipment and have the ability to segregate and store apples for marketing over the year. The northwest Michigan growers would want to work closely with one or more of these packers on production standards and management of ongoing operations.

3. Where aggregation is required to meet the needs of large buyers, such as supermarkets and institutions. Production standard development should be conducive to the aggregation of farmer's products, because of the resulting consistency of quality and the ability to create the sizing and grading uniformity rules acceptable to supermarkets (Abatekassa & Peterson, 2011). The ability to aggregate numerous farmers' products should enable the distribution of larger product volumes and sales in wider geographical areas (statewide, nationally, internationally). Furthermore, the specific set of standards that is developed can be protected as intellectual property for purposes of branding and reputation development. This circumstance could apply to both the garlic and the northwest Michigan Honeycrisp groups mentioned above. The Honeycrisp group likely will require a wider distribution than its growing region to make the effort feasible, so working with larger retailers in the Great Lakes region could be a great fit. The southern Michigan

garlic group might find after some time that development of distribution around the state is feasible and within their aggregate capacity, given a sufficient price premium or net return.

4. Where voluntary organizations are preferable to mandatory organizations (e.g. marketing orders.¹⁰¹) Whereas marketing orders impose requirements and taxes on all the farmers in a region that are growing a particular product, the ODG mode can be used to set up an organization that is voluntary to join.¹⁰² The garlic group mentioned above provides an illustrative example. The subset of garlic growers that is interested in creating a value added product could organize without implicating all garlic growers in the delineated area like a marketing order would. Furthermore, to ensure that the opportunity extends to all growers, ODGs are designed to have open membership for any new producers willing to follow the production rules. The result is that the voluntary aspect of ODGs does not lead to an exclusive closed club.

5. Where fairness and equity between value chain actors is a need. Fairness is an integral part of the French ODG model, due to specific requirements for a balance of power between actors

¹⁰¹ State and federal marketing orders in the United States impose fees (and rules in some circumstances) on all of the farmers in the area that grow the particular product. These are voted in often by a simple majority of producers, sometimes by slim margins. State marketing orders have oversight by the states (e.g. Michigan, see the Agricultural Commodities Marketing Act of 1965 at MCL § 290.651 *et seq.*), and federal marketing orders are overseen by the US Department of Agriculture, who authority to approve or disapprove actions by the group or board managing the marketing order. 7 U.S.C. § 601 *et seq.* In my opinion, ODGs are more farmer-centric and have less heavy ongoing political and government involvement once started (for example, members of the Michigan state agricultural marketing committees are appointed by the governor.)

Anti-trust exemptions are made for marketing orders via the Agricultural Marketing Act of 1937, and processors are allowed to be involved (for example, the tart cherry federal marketing order is voted on by growers but creates duties for processors). 7 U.S.C. § 608(b). As such, one strength of marketing orders is that quantity control measures can legally be taken by the industry in an attempt to provide consistency of price, and in some cases such as tart cherries, availability of product inventory to ensure consistent supply to buyers. However, these quantity control measures require growers to ‘set aside’ or even dump product on the ground by law; and strong disagreements can occur within the industry.

ODGs are voluntary; while farmers and other operators are required to comply with the production rules and often to pay annual fees in order to market their products using the ODGs quality sign/brand name, farmers are free to sell their products in other markets, including commodities markets. Furthermore ODGs can have not only processors, but as many other upstream and downstream value chain actors as is practicable.

¹⁰² This applies generally to development in the U.S., and to certain quality sign ODGs in France. However, while with PGI and PDO/AOC groups membership is not mandatory, farmers in the region cannot use the regional brand developed without following the specifications and joining the ODG.

in an ODG and to an underlying focus on fairness in contracts under French law. As detailed in Section II above, these aspects can be infused into an ODG-mode organization in the United States using certain provisions in organizational documents and/or, if necessary, by creating oversight mechanisms (although these oversight mechanisms might have a significant cost). Take, for example, a product such as a cheese organized by Michigan milk producers, which is produced for larger-scale distribution in the Great Lakes region. Processors and/or transformers would need to be involved to deal with producing and ripening the cheese from the raw product (milk.) Given that processors are often very concentrated in the dairy industry, farmers could use an ODG to both involve the downstream actors and protect their decisionmaking voice and power within the organization.

Less ideal contexts for the ODG mode

As with any mode or entity, the ODG mode would not be a great fit with every circumstance and does not promise to be a silver bullet. Here are a few circumstances where the ODG mode should clearly be avoided:

1. The ODG mode would not work well for marketing a large number of individual products because it would be difficult to create production standards for each product. An example would be a multiple-farm CSA collaboration – for grouping numerous market garden products, whether through seasonal subscription or through a common online ordering system, a cooperative or LLC would likely be better fit. However, a strong umbrella brand for market garden products could facilitate the creation of production standards for a large number of products over time.

2. The ODG mode would not be a good fit for the conventional version of commodity products such as corn, soybeans, or oranges. The ODG mode is mainly applicable to value added

products, because the production rules are intended to provide something different or additional in comparison to the commodity version of the product, such as varietal or regional qualities.

3. The ODG mode would not be a good fit for products that have a large variability in size, appearance, or variety, if the intent is to aggregate for larger-scope wholesale markets such as supermarkets. This is because supermarkets normally require a significant amount of uniformity (Thompson & Gaskin, 2018). For example, a group of farmers wants to work together to market a certain variety of peach, but there is great variability between size and color of peaches from each of the different farmers.

CONCLUSION

French ODGs provide one model for regionally-based food product organization. Geographical indications have been comprehensively studied as an intellectual property umbrella that farmers can gather under, boasting well-known products from France and around the world. However, less is known about the nature of the collective management organizations underlying those products. This research investigated the legal underpinnings as well as institutional supports that affect the structure of these collectively managed entities in France. France's statutory and regulatory regimes for ODGs have unique attributes and strengths, including a focus on fairness and balance in structure, and an ability to include not only farmers, but also packers, processors, cheese ripeners, and other value chain actors. Each of the relevant actors for a particular product can potentially be involved in determining the product rules that will apply to them.

Many of the strengths found in the French context can indeed be translated to the context of the United States. Some aspects of ODGs are relatively simple to replicate, given the relatively

similar state background institutions, legal systems,¹⁰³ and property rights enforcement (rule of law). Other aspects of ODGs are more difficult to replicate due to their connection with unique institutions in France and the EU that are dedicated to quality sign products. Replicating these would therefore require the creation of oversight bodies for some aspects, and development and funding of outreach experts for others. However, the benefits of these efforts could potentially outweigh the costs, if enough participation and volume were achieved.

An area of future research would be to investigate to what extent and how the strengths of ODGs could be replicated in other contexts that have weaker, or significantly different, government institutional support. In particular, it may be valuable to determine if the aspects of balanced representation and democratic functioning can effectively be replicated in order to provide farmer groups with more negotiating power vis-à-vis concentrated value chain actors such as processors.

¹⁰³ While France has a civil law system as opposed to the common law system used in the United States, contract, corporate, and commercial law are quite similar in each country.

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CHAPTER 5. *Conclusion*

The research results described in previous chapters are small steps toward answering the larger question of whether high levels of farmer input and control over quality label initiatives will yield better outcomes for farm economic viability. To conclude this dissertation, I discuss an application of the ODG model to a hypothetical case, informed by farmer interests in nest boxes. I then discuss limitations and suggestions for future research to help address remaining gaps in knowledge.

HYPOTHETICAL APPLICATION OF THE ODG MODEL TO CONSERVATION PRACTICES IN MICHIGAN CHERRIES

Chapters 2 and 3 analyzed the ecoservice or conservation practice of installing nest boxes for attracting raptors has potential to be part of, or even the basis of, a quality label. This is because it is a practice already used by some farmers in the cherry and blueberry industries, is inexpensive for other farmers to adopt, and has proven effectiveness in helping to control bird damage in fruit.

However, there was much greater efficacy in the cherry region than in the blueberry region, for two reasons: 1) the kestrel nesting season overlaps the entire sweet cherry season, so that kestrels are warding off fruit eating birds until the fruit is harvested; however, fledgling kestrels fly off in the middle of the blueberry season and the adult kestrels leave the nest boxes. This means that only early season blueberries are protected from bird damage by the kestrels. 2) The rate of population of the nest boxes was much higher in the cherry region. This is perhaps because of past efforts to encourage kestrels in northwest Michigan. Therefore, while the support for installing nest boxes generally exists in the blueberry industry, the practice is more ideal for the cherry

industry, which demonstrates the importance of obtaining farmer input for potential production rules.

For this hypothetical example, I will use the cherry industry in Michigan as the case for exploring the inclusion of nest boxes and other conservation practices that many farmers reported using (e.g. pest management methods that encourage beneficial insects, methods that are beneficial for soil health, such as the use of compost or mulches, etc.) in an ODG quality label. An ODG-type organization could be developed that would provide a space for negotiation of the quality label's rules. Organizers would develop a state-level non-profit association (even if the label is later expanded to the greater North American cherry industry, as it has to be based in one state). In following with the ODG mode, the bylaws of the organization could either make all the cherry growers members of the organization with direct voting rights, or implement delegated membership with a representative democratic process; in short, it should be organized so that farmers have a voice in the production rule development and other activities of the organization. It would need to be determined whether packers and/or processor companies would be members of the ODG. For processed tart cherry products, membership by processors would be more essential relative to fresh sweet cherries, for which packing activities could potentially be carried out on a contractual basis.

To develop the production rules, input could be gathered from Michigan cherry farmers for priorities and for the practical issues involved with each practice. While it might be easy for all farmers to install nest boxes, it might not be practicable for all growers to utilize compost regularly, for example, due to variances in food safety rules. Many of those farmers that can't use compost, however, might be using mulches, or could relatively easily adopt the use of (inexpensive) mulches such as straw or wood chips. In this way, the quality label has the potential to promise sustainable

soil-building inputs, and farmers have a choice in which inputs they use. Similarly, the rules could suggest four natural input practices (e.g. compost, mulching, having a mower side-vent grass clipping to the trees, planting legumes in the drive rows), two of which are required to obtain the label. Additionally, growers could determine what grades or varieties of fruit would or would not be sold under the label. In order to develop a strong quality reputation, for example, they may choose to only use cherries of a certain size and that have a full development of color. Industry actors such as processors and packers should be involved in the discussions in order to provide input on the practical issues related to grading and to help develop a plan for keeping quality labeled products separated from other products.

Once the standards are developed, the ODG-type nonprofit organization could develop a logo (or set of logos) that it approves for use. These logos can then be trademarked with the United States Patent and Trademark Office in order to benefit from intellectual property protection both domestically and internationally. The organization could develop its preferred method of ensuring that farmers and processors are following the rules, and that the labeled product has indeed been raised under the standards. These control checks could be conducted by a third party certifier, unless consumer trust is high enough for these practices that the organization could perform them internally—nest boxes may be visible enough that consumers would place more confidence in farmer claims to use this practice, for example, particularly in comparison to those (e.g. applications of synthetic pesticides) that may relate to personal health concerns.

Farmers would not be legally obligated to follow the standards as they are entirely voluntary. However, in order to use the logo, or state that some or all of their products were grown as part of the conservation practices label, they would be obligated to follow the standards; the ODG-type

organization would have the right to take action against a farmer for fraudulent claims in courts if necessary.

LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

There are several limitations of the research described in this dissertation, in addition to those discussed in previous chapters. We focused on just two fruit growing industries that are concentrated in particular regions of the US, and which use similar pest management practices. More research is needed to determine if the expressed farmer interest in nest boxes may also apply to other fruits, and to regions where cherries and blueberries are less prevalent. Additionally, there are a wide variety of potential sustainable farming practices, and we were only able to focus on a very few. Much more research is needed on farmer interests in other potential quality criteria, and for other food products. These might include not only sustainability criteria, but social and animal welfare criteria. Such efforts could be integrated with research on metrics, such as life cycle assessments, to more accurately measure the concordance between desired and actual impacts of label criteria.

An extremely important area of research for quality labelling efforts is the marketability of production and processing practices, and their associated quality attributes. If labeling initiatives are to contribute to farm economic viability, we need to know more about the level of interest that consumers have for the most promising food items, production practices and geographies. What quality aspects and practices do consumers value? Furthermore, what types of information are most preferred to convey these qualities, in conjunction with logos or seals?

Although I was able to conduct a comprehensive examination of the law, regulation, and programmatic rules related to ODGs, I was only able to interview managers and/or operators and

farmers from twelve quality groups in France. Therefore, information about motivations, purposes, and institutional support during development cannot be extended to all ODGs in this nation, nor to all collective management bodies used for GIs. Furthermore, the internal structure of ODGs varies across cases; some have only farmer members, and some have cooperatives and downstream actors such as processors as voting members. A potential next step in research could be to analyze the internal structure of ODGs. How are the decision rights and voting organized between the different actors involved, such as farmers and processors? Also, what are the main reasons for differences in structure? For example, what role does product type play? Is the democratic structure affected by a high level of grower engagement or more robust outside institutional support?

Another suggestion for research is related to policies that govern quality groups as collective agribusiness organizations in the area of anti-trust or competition law. Since quality groups work similar to vertically integrated corporations, expressing control over the production process and methods, should they be granted exemptions from anti-trust rules similar to cooperatives, at least for limited purposes? In order to qualify for an exemption, what are the factors that would sufficiently distinguish a quality group production chain from its less-vertical counterparts? It would be worthwhile to explore whether competition between different quality groups and conventional firms producing the same category product would sufficiently (or better) serve the underlying public purposes of anti-trust/competition law, given the fact that many of these agri-food quality groups have far lower production volumes and market power than many large, vertically integrated firms.

APPENDICES

APPENDIX A:

Farmer Pest Management & Conservation Practice Questionnaire

Please circle the appropriate "bullet", "Y" for yes, or "N" for no.

1. Number of years in farming _____

2. Number of generations involved with agriculture:

- 1st (immediate family)
- 2nd
- 3rd
- 4th
- Other: _____

3. Number of acres in:

- Tart cherries _____
- Sweet cherries (fresh market) _____
- Sweet cherries (processing market) _____
- Blueberries _____

4. Level of education:

- Some high school
- High school diploma
- Associates degree, or some college
- Bachelor's degree
- Graduate degree

5. Do you consider yourself a full-time or part-time grower?

- Full-time
- Part-time

6. Who does the majority of spraying and other pest management applications on your farm?

- You
- Employee
- Other _____

7. Who monitors/scouts your crops? *Circle all that apply.*

- Yourself
- Employee/ family member
- Independent crop consultant
- Scout provided by your cooperative
- Chemical supplier
- Other: _____

8. What sources of information do you use for pest management decisions? Which are most useful on a scale of 1 to 5 (5=very useful)?

Weather data/forecasts (Write in forecast type):

	Used? Yes or No	Not Useful	Somewhat Useful	Fairly Useful	Useful	Very Useful
_____		1	2	3	4	5
_____		1	2	3	4	5
_____		1	2	3	4	5
_____		1	2	3	4	5

	Used? Yes or No	Not Useful	Somewhat Useful	Fairly Useful	Useful	Very Useful
MSU reports (Extension or Research)	Y N	1	2	3	4	5
Scout information	Y N	1	2	3	4	5
Chemical supplier/ Local Ag product suppliers	Y N	1	2	3	4	5
Trap catches	Y N	1	2	3	4	5
IPM Updates	Y N	1	2	3	4	5
Other farmers	Y N	1	2	3	4	5
Trial and error	Y N	1	2	3	4	5
On-farm experiments (home, research, other farms)	Y N	1	2	3	4	5
Cooperative communications	Y N	1	2	3	4	5
Other: _____		1	2	3	4	5

9. Approximate/ball park amount spent on pest management spray materials (insecticide and fungicide), annually per acre: \$_____/acre

Does estimate include:

- ☐ Herbicides Y N
- ☐ Labor Y N
- ☐ Fertilizer or other amendments Y N

10. a. Are you are a member of a cooperative for blueberries or cherries?..... Y N

b. If yes, which of the following services are provided by your cooperative? *Circle all that apply.*

- Scouting
- Minimum Residue Limit (MRL) testing
- Export-oriented management advice
- Pest/disease manuals or guides
- Other services related to pest management: _____

11. Please rate how important you perceive the following consumer preferences to be for the marketing of your products, on a scale of 1 to 5 (5=very important)?

	Not Important	Somewhat Important	Fairly Important	Important	Very Important
Lack of visible spray residue	1	2	3	4	5
Blemish-free fruit	1	2	3	4	5
Use of low-risk chemicals	1	2	3	4	5
Fair labor practices	1	2	3	4	5
Sustainable or conservation management practices	1	2	3	4	5
Other _____	1	2	3	4	5

12. What methods of bird control have you used, and how effective are they on a scale of 1 to 5 (5=very effective)?

	Used? Yes or No	Not Effective	Somewhat Effective	Fairly Effective	Effective	Very Effective
Wind Sock person	Y N	1	2	3	4	5
Bird Scare Device (Height set at: _____) ...	Y N	1	2	3	4	5
Canons	Y N	1	2	3	4	5
Avian Control sprays	Y N	1	2	3	4	5
Nest Boxes	Y N	1	2	3	4	5
Falconer	Y N	1	2	3	4	5
Other Methods _____		1	2	3	4	5

13. Which of the following methods or practices do have you or do you use, and how strongly do you support their use or feel that they are important on a scale of 1 to 5 (5=Strongly support):

	Used? Yes or No	Do not Support	Somewhat Support	Moderately Support	Support	Strongly Support
Wildflower strips	Y N	1	2	3	4	5
Creating bee habitat (Mason, horned faced).....	Y N	1	2	3	4	5
Wildlife habitat/restoration	Y N	1	2	3	4	5
Nest boxes	Y N	1	2	3	4	5
Cultivation, maintenance, or release of beneficial insects/natural enemies (e.g. parasitic wasps, ladybugs)	Y N	1	2	3	4	5
Integrated Pest Management (IPM)	Y N	1	2	3	4	5
Mating disruption or Pheromone ties	Y N	1	2	3	4	5
Maintain plants or cover crops for beneficials ..	Y N	1	2	3	4	5
Mowing to help manage rodents	Y N	1	2	3	4	5
Mowing weeds to manage arthropods	Y N	1	2	3	4	5
Windbreaks/hedgerows/natural barriers for drift.	Y N	1	2	3	4	5
Pruning for improved spray coverage	Y N	1	2	3	4	5
Resistance management planning	Y N	1	2	3	4	5
Scouting for beneficials	Y N	1	2	3	4	5
Other practices _____		1	2	3	4	5

14. How many times per year do you apply herbicides for weed management in your orchard or field?
Circle the appropriate answer:

1 time 2 times 3 times 4+ times

15. Do you base your nutrient management/ fertilizer applications on: *Circle all that apply.*

- Soil sample analysis
- Leaf sample analysis
- Crop yield calculations
- Other: _____

16. Which of the following soil management practices do you use? *Circle all that apply.*

- Compost or manure application
- Mulching
- Cover cropping (between perennial plantings or otherwise on your farm)
- Other _____

17. What is your predominant soil type or types, if known (e.g. sandy loam, etc.)?

- _____
- _____

18. Have you participate in any of the following programs? *Circle all that apply.*

- USDA Environmental Quality Incentives Program (EQIP)
- USDA Conservation Stewardship Program (CSP)
- Michigan Agricultural Environmental Assurance Program (MAEAP)

19. Are your orchards/fields generally: *Circle all that apply.*

- Isolated from other orchards/fields in way that positively affects pest management?
- Isolated from other types of crops (fruit, vegetable, etc.) in a way that positively affects pest management?

APPENDIX B:

Bird Damage Decision-making Survey

Introduction:

This survey will take approximately 8 to 12 minutes to complete. Clicking the “next” button below indicates your consent to participate.

Section I: Farm data, preferences, practices

- a. Your generation farming (select one) 1st, 2nd, 3rd, 4th, 5th or more
- b. How many years have you been farming? _____
- c-h. Acres:
- Total Blueberry acres _____
 - Total Cherry acres:
 - Sweet Cherries _____
 - Tart Cherries _____
 - Total acres managed (all crops): _____
 - Total organically farmed acreage (all crops: certified, transitional, or exempt): _____
 - Total U-pick acreage: _____
- i. What state do you farm in? **Please list all** that apply: _____ [write in –NOT drop down]
- j. On a scale of 1 to 5, how much of a problem is **bird damage** for your farm? [1= not much 5= big problem]
- k. Which of the following **methods of bird management** have you tried in the past, or are you currently using? **Please select all** that apply:
- Avian control sprays
 - Cannons, blank shots, or other loud noises
 - Drones
 - Falconer
 - Lasers
 - Live Ammunition
 - Nest boxes for attracting predatory birds
 - Netting
 - Recorded bird calls/squawk boxes
 - Visual scare methods (inflatable tube-men, plastic owls or hawks, other)
 - Other (please describe) _____
- l. On a scale of 1 to 5, **How abundant are natural predators of fruit eating birds** in your area and on your farm, such as American Kestrels and other raptors? (1= not many at all, 5=saturation; Also have a “Don’t know” button
- m. Which of the following **conservation practices or methods** have you engaged in? **Please select all** that apply:
- Beneficial insects (direct cultivation of, or adjusting pest program to reduce harming beneficials)
 - Compost use as an input (for nutrient addition, stimulation of soil biology, etc.)
 - “Mow and Blow” – side blowing cuttings under the row to act as mulch
 - Mowing for rodent control
 - Mulching (straw, woodchips, hay, sawdust, or other organic materials)

- Planting clover or other legumes between rows
- Pollinator habitat development (wildflower strips, etc.)
- Pruning to improve spray coverage
- Resistance management (rotation of pesticide classes to minimize the development of resistant pests and diseases)
- Scouting for beneficial insects

n. Please rate how **important** you perceive the following **consumer preferences** to be for the marketing of your products. [Scale of 1 (not important) to 5 (very important)]

- Lack of visible spray residue
- Blemish-free fruit
- Use of low-risk chemicals
- Local origin
- Conservation management practices

o. Please note your agreement with the following statement: “I would be more likely to use a conservation practice if Extension or other industry support provided **information about the benefits**, and when and how to implement the practice.” Scale of one to five, 1=Strongly disagree 5= strongly agree; also have a “Not sure” button

Section II.

Please read the following:

We have recently carried out research on various aspects of installing nest boxes for American kestrels, as a method of helping to manage bird damage from small fruit-eating birds. American kestrels are small falcons that are widely distributed in the United States although their abundance varies regionally. For example, they are least abundant in the southeastern United States. Kestrels use open habitat with short vegetation and sparse trees.

- Fruit eating birds have been found to be **80% less abundant** near kestrel nest boxes in comparison to areas without boxes in pilot studies – this translates to saving approximately 70 pounds per acre of sweet cherries from bird damage
- Kestrel nest boxes **can be installed for less than \$100**, and should be placed **½ mile apart** because kestrels are territorial
- Consumers are supportive of nest boxes, and our research suggests they are **willing to pay slightly more** for fruit produced with this practice
- Nest boxes will not solve all pest management problems, and are more likely to attract kestrels in areas with longer histories of nest box usage. They are **most effective** where the kestrel nesting season coincides with fruit ripening.
- Preliminary research suggests pesticides may be used without negatively affecting kestrels, although **rodenticides should be avoided** because kestrels eat voles and mice

See more about regional kestrel nest box counts and occupancy rates at:

<https://kestrel.peregrinefund.org/data-display>

I. Based on the information above, what is your **interest in adopting** nest boxes on your farm? (Scale of 1 to 5, 1=not interested 5= highly interested):

II. If there were an industry effort to adopt nest boxes (one that would have potential for marketing to consumers) what would your interest be in joining that effort by installing nest boxes? (Scale of 1 to 5)

Section III: FCM and Cultural Shared Agreement Metrics.

Scenario Instructions: These final eight questions may require some additional time for the first few, but the rest should flow fairly quickly. We want to know what you would expect to happen if certain changes occurred on your farm. For example, if there were a significant amount of weekly rain on your farm... irrigation needs would likely decrease. The goal for these questions is to learn more about how farmers think about pest management, and how conservation practices such as adopting nest boxes for natural predators fit within the decision-making matrix.

1) We are looking at the impact of pest pressure on several other variables. If there were a significant increase in pest pressure on your farm, do you think...

- **Fruit Quality** would: Increase Sig, Inc. some, Stay same, Decrease, Dec. Sig?
- **Overall Costs/Spending** would: Increase Sig, Inc. some, Stay same, Decrease, Dec. Sig?
- **Yield** would: Increase Sig, Inc. some, Stay same, Decrease, Dec. Sig?
- **Income** would: Increase Sig, Inc. some, Stay same, Decrease, Dec. Sig?

2) What is the impact of bees on other variables? If there were a significant increase in bees on your farm (of any type: honeybees and/or others)...

- **Pest Pressure** would: Increase Sig, Inc. some, Stay same, Decrease, Dec. Sig?
- **Fruit Quality** would: Increase Sig, Inc. some, Stay same, Decrease, Dec. Sig?
- **Yield** would: Increase Sig, Inc. some, Stay same, Decrease, Dec. Sig?
- **Income** would: increase Sig, Inc. some, Stay same, Decrease, Dec. Sig?

3) If there were a significant increase in bird damage on your farm...

- **Overall costs/Spending** would: Increase Sig, Inc. some, Stay same, Decrease, Dec. Sig?
- **Pest Pressure** would: Increase Sig, Inc. some, Stay same, Decrease, Dec. Sig?
- **Fruit Quality** would: Increase Sig, Inc. some, Stay same, Decrease, Dec. Sig?
- **Income** would: Increase Sig, Inc. some, Stay same, Decrease, Dec. Sig?

4) If there were a significant increase in natural predators of birds, mice, insects, etc. on your farm...

- **Pest pressure** would: Increase Sig, Inc. some, Stay same, Decrease, Dec. Sig?
- **Overall Costs/Spending** would: Increase Sig, Inc. some, Stay same, Decrease, Dec. Sig?
- **Fruit Quality** would: Increase Sig, Inc. some, Stay same, Decrease, Dec. Sig?
- **Income** would: Increase Sig, Inc. some, Stay same, Decrease, Dec. Sig?
- **Bird Damage** would: Increase Sig, Inc. some, Stay same, Decrease, Dec. Sig?

5) If there were a significant increase in regulations/label requirements on chemicals used for pest management...

- **Overall Costs/Spending** would: Increase Sig, Inc. some, Stay same, Decrease, Dec. Sig?
- **Pest Pressure** would: Increase Sig, Inc. some, Stay same, Decrease, Dec. Sig?
- **Fruit Quality** would: Increase Sig, Inc. some, Stay same, Decrease, Dec. Sig?
- **Income** would: Increase Sig, Inc. some, Stay same, Decrease, Dec. Sig?

6) If there were a significant increase in beneficial insects on your farm...

- **Overall Costs/Spending** would: Increase Sig, Inc. some, Stay same, Decrease, Dec. Sig?
- **Pest Pressure** would: Increase Sig, Inc. some, Stay same, Decrease, Dec. Sig?

- **Fruit Quality** would: Increase Sig, Inc. some, Stay same, Decrease, Dec. Sig?
- **Income** would: Increase Sig, Inc. some, Stay same, Decrease, Dec. Sig?

7) If you were to significantly decrease the usage of **cultural/non-chemical practices** on your farm (pruning for spray coverage, mulching, mowing for rodents, etc.)...

- **Pest Pressure** would: Increase Sig, Inc. some, Stay same, Decrease, Dec. Sig?
- **Fruit Quality** would: Increase Sig, Inc. some, Stay same, Decrease, Dec. Sig?
- **Yield** would: Increase Sig, Inc. some, Stay same, Decrease, Dec. Sig?
- **Income** would: Increase Sig, Inc. some, Stay same, Decrease, Dec. Sig?

8) An effective **chemical resistance management plan** (rotation of pesticide classes to minimize the development of resistant pests and diseases) will cause...

- **Overall Costs/Spending to** Increase Sig, Inc. some, Stay same, Decrease, Dec. Sig?
- **Income to** Increase Sig, Inc. some, Stay same, Decrease, Dec. Sig?
- **Pest Pressure to** Increase Sig, Inc. some, Stay same, Decrease, Dec. Sig?
- **Fruit Quality to** Increase Sig, Inc. some, Stay same, Decrease, Dec. Sig?

--

Thank you!

Your responses have been recorded.

APPENDIX C:

ODG Management Interview Guide (English)

[NOTE: If the interviewee represents a COOPERATIVE or another VALUE CHAIN ACTOR, begin by using the respective question set found at the end of this document, then resume at PART I.]

PART I. ODG Members and Production

A. Who are the members of [insert name of ODG] ?

B. Can you tell me about the farmers involved in [insert name of ODG] ?

- What is diversity in the size of the farms in the ODG?
- What other products are commonly raised by farmers producing [insert product name] ?
- [If group has multiple SIQO products:] Do the same farmers participate in the different products, or are they distinct groups?

C. Can you describe the rest of the filière? Describe the Value Chain (from farm to fork!)

- Which supply chain actors are not in the ODG?
- Are there any cooperatives involved?
- Are there any Organisations de Producteurs inside or outside the ODG?
- What are the functions of each of these other value chain actors?
- What are the day-to-day relationships among operators, both formal and informal?

Part II. ODG Legal Structure

D. How are decisions made? My interest is especially the legal domain.

[NOTE: Discuss statutes and règlement intérieur to confirm (e.g. that processor has same weight as...)]

- Composition of the general assembly? Are delegates used? **Engagement (%)** ?
- What decisions are made by the GA? Voting process?
- [For Syndicates:] How is the election process affected by elections for the departmental chambers of agriculture?
- Composition of the Conseil d'Administration? Election process?
- What decisions are made by the Conseil? Voting process?
- Do you have a 'règlement intérieur'?
- [Confirm legal entity used...]
- [If there are one or more cooperatives and/or producer organizations:] Are there any farmer members that are outside/not part of the cooperative(s), of the producer organizations?
- Does your ODG adhere pretty closely to the statutes? Are there any differences between what is written in the statutes and what is practiced?

E. Have there been any changes over time in the structure/configuration of [insert name of ODG]?

- Which? How have these affected [insert name of ODG]?
- Why did these changes take place?
- What is your experience with reporting/dealing with the INAO on the changes?

F. What is the weight or place of farmers within the decision-making structure?

- How strong is their position within the overall group, in terms of decision-making rights?
- What has affected the negotiations/outcomes? The perishability of the product? The state of the market (supply and demand, nature/location of consumers, et cetera)?
- **Level of farmer engagement/** participation ?

G. What are the rules and procedures for bringing in new operators (farmers, other VC actors)? [If already have this information, just discuss and confirm.]

- If these rules have changed over time, what has changed, and how has the ODG been affected?

H. Are there any Associate members in your ODG? If so, please list/describe these members.

- Which decisions do they participate in?
- Which decisions are they not allowed to participate in?

I. During the process of creation of an ODG, the INAO must evaluate the following elements: représentativité des opérateurs, fonctionnement démocratique, et caractère équilibré de la représentation des différentes catégories d'opérateurs. In your situation, how does your ODG meet these criteria?

- How could it better meet these criteria?
- In other words, what is the fairness of the composition and voting structure:
 - within the ODG, and
 - within the larger value chain ?

J. Do any actors/opérateurs within the value chain set a base price for farmers? If so, what is the process for this?

- For example, does the cooperative set a price (or MARGIN) regularly?
- What methods are used by operators to regulate **QUANTITY** within the value chain? Please describe.

PART III. ODG Operations

K. What is does your ODG do, what does its management involve? In other words, how does [insert ODG name] work with these operators to coordinate production?

- What are the critical points in the production process for [insert name of product]?
- What types of unexpected issues come up, and how do you deal with them?
- What are the day-to-day relationships among operators, both formal and informal?

L. Are there any particular pieces of equipment/ other [specific] assets [or labor types] that are important for the production process for [insert name of product]? If so please describe.

- How is their use secured within the value chain (e.g. purchase by the cooperative, lease out)?
- Is there cross ownership of these assets by different operators?
- Are there any issues with labor at one or more points in the production process (harvesting, processing, packaging ...) that affect [ODG]?

M. What property is owned or leased by the ODG, if any?

N. Control. How does [insert name of ODG] ensure compliance with the specifications?

- Is technical assistance one of the missions- helping farmers to adapt to the CDC? If so, what types of outreach and assistance are given?
- What does a 'batch' consist of for testing purposes?
- [If necessary, to confirm:] What are the control points defined in the specifications?

O. How are costs of certification covered (the ongoing payments to the Organisme de Contrôle) ?

- Do the cotisations cover the costs?

- Do farmers pay by volume?

P. What type of marketing is done by the ODG, if any?

- Modes of advertising?
- Budget? and, how is it financed?

Q. What do you do to protect your sign/product?

- Litigation- frequency? Approximate costs?
- Perspective on INAO effectiveness in this area?

PART IV. ODG History, Development Process, and Institutional Support

R. How did the [insert name of ODG] get started?

- Who was the original organizer? (**Get name/contact information if possible**)
- What (type of) operators were behind the beginning of the effort?
- How did you get involved in working with [insert ODG name] ?

S. Can you describe the process of development, of construction of the ODG?

- Cahier des Charges
- Delineation of the geographic area [if applicable]
 - Did an outside expert help, using site visits for example
- Within the collective, how has decision-making evolved? For example, the choice of who would be on the Conseil d'Administration...

T. What institutional support was there during the development process? [If not answered above]

- INAO support
- Other governmental or nongovernmental consultants? For what specific points?
- Researchers, and if yes, from what disciplines? For what specific points?

U. How has the production of [name of product] evolved over time?

- Growth or decline in number of farmers participating, and reasons?
- Growth or decline in sales volume/revenue, reasons for?
- Growth or decline in number of other operators participating, reasons for?
- Market evolution (national/international)?

PART V. External Influences

V. Do government subsidies or other support (besides INAO services) encourage/incentivize farmers or other operators to use this or other SIQO labels?

- Why are farmers joining in to produce [name of product] ? [If applicable]
- Are there any other policies or laws that affect SIQO adoption (e.g. rural property laws, the Common Agricultural Policy/la politique agricole commune (PAQ))?

W. What is the level of competition in the marketplace with [insert name of product] ?

- Competition with conventional?
- Competition with other quality labels?
- What level of price premium is there?

END of INTERVIEW

If interviewee represents a COOPERATIVE:

X1. What does your cooperative do?

- How do you work with [product] ?
- How do you work with other value chain actors, both formally and informally?
- What percentage of your business is focused on [product] ?
- What methods do you use to control QUANTITY, if any? [NOTE: might need to wait until Part III to ask this]
- What methods do you use to control PRICE, if any? [NOTE: might need to wait until Part III to ask this]

X2. How is your cooperative organized ? How is the decisionmaking structured?

- What decisions does the membership vote on?
- Is there a delegate structure?
- Who is on the Conseil d'Administration?
- What are the main decisions that the Conseil makes?
- Are there 'outside' directors on the Conseil?
- Are there "nonvoting" members/owners?
- Are there voting, "non-cooperator" members/owners?
- Is there pro rata/ volume-based voting?

If Interviewee represents another VALUE CHAIN ACTOR:

Y1. What does your business do?

- Main products?
- Other SIQOs?
- How do you work with [product] ?
- What percentage of your business is focused on [product] ?

Y2. What is the ownership structure of your business?

- Who owns it?
- Is there cross ownership by operators in [ODG] ?
- Are there operators from the ODG on Conseil d'Administration of your business?

APPENDIX D:

ODG Farmer Interview Guide (English)

PART I. Production and Value Chain Operation

- 1. How long have you been doing this, producing [product]?**
- 2. Please describe the different steps involved in your production of [product].**
 - Genetics
 - Production
 - Harvest
- 3. Please describe what happens to your product after it leaves your farm.**
 - What are the next steps in the value chain?
 - Who buys, processes, sells, delivers, et cetera?
- 4. Are there any improvements could be made in the production process/value chain steps, if so please describe?**

PART II. Implications of Working with the ODG

- 5. What are the implications for you and your business of working with [ODG/product] ?**
 - What changes did you have to make to work with the specifications?
 - You joined in [year stated above] - Why did you not join before that?
- 6. What are the advantages for you and your farm of working with [ODG/SIQO] ?**
 - What are the financial benefits- price premiums, markets, other?
 - What are the advantages for your farming style, way of life?
 - What other benefits do you find?
- 7. What are the constraints and disadvantages of working with [ODG/SIQO] ?**
 - What are the financial costs?
 - Equipment/materials/supplies
 - Contrôle
 - Cotisations
 - Paid labor
 - What extra time is involved?
 - Meetings (how far are they, time spent), communication with ODG, working with others
 - Your labor- what do you do that takes extra time?
 - Time spent on contrôle aspects
 - Any other implications/constraints/disadvantages?
- 8. What differences in specifications would you like to have, if you could have your wish?**
 - How would you farm differently, if you could receive the same price for your product?

9. Generally, what types of challenges do you encounter when working with other farmers and businesses on a quality label?

10. What government subsidies are available for farmers who want to work with [ODG] or other SIQOs?

PART III. ODG Decisionmaking and Value Chain Arrangement

11. Much of my research focus is on how decisions are made within ODGs. Please describe the process of [example decision]?

- How did voting work/ who made the decisions?
- Was the outcome equitable?
- Do you have any other thoughts on how decisions are made, or examples?

12. Are there any power struggles between operators or businesses within the ODG? Please describe.

- What is the underlying reason for the struggle(s)?
- How could this/these conflicts be remediated?

13. Do you think the arrangement between operators in the ODG is equitable/balanced?

- Is it equitable to the farmers? Why yes or no?
- Is it equitable to non-farm operators? Why yes or no?
- Have the benefits eroded to downstream actors over time?

14. What improvements could be made in the arrangement between operators/structure of the ODG?

- What could have made the distribution of value more equitable?

PART V. Follow up

15. I am looking for a few other farmers to talk to- do you have any contacts that you could share?

- Newer adopters of the CDC/ longer members
- Farmers more involved, less involved with ODG
- Smaller, middle, larger volume producers
- Farmers more exited, not as excited about the ODG
- Drivers of the ODG, followers
- For or against the example decision
- TELEPHONE interviews if necessary to get a sample!