Centre for Organic
Research & Education

Guidelines for Establishing & Operating an Urban Agriculture Enterprise in Queensland



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CORE's Charitable Purpose

"The Collaboration, Advocacy, Research, and Education activities of CORE continue to serve to educate people about the organic cycle and organic systems. Particular focus is placed on the role of organic recycling, food production and bio-products in providing high quality, healthier and safer organic products, systems and soils, creating the foundation for a more liveable, loveable and sustainable environment".

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Contents

Definitions

The following definitions are provided to identify the context for the use of terms used in this guideline.

- **Agriculture** – Production of primary produce generally on a commercial scale and mainly not in urban environments. It includes chemical, genetically modified (GM) and organic/biological methods of soil, plant and animal management. The primary produce (not processed) includes vegetables, herbs, fruit/nuts, grains, meats and dairy products. Food production is mostly sold through complex supply chains and often requiring considerable transport and storage. Large amount of machinery and capital is often involved.
- **Biodynamic farming/gardening** – This certified farming system is a method of organic growing with a strong focus on soil life (microbiology), plant/animal vitality, ecology and community. Biodynamic can be used for large commercial scale agriculture, urban agriculture and home gardening.
- **City Farms** – Normally larger scale community gardens with education and events. Food growing is community run and rarely on a commercial scale. Their activity can be considered urban agriculture. Northey Street City Farm in Brisbane is a good example.
- **Community gardens** – These are located within public spaces, schools and community living areas of urban environments. The food growing is mostly non-commercial, however the garden area may host events, education and community events. Food growing methods are normally organic and some permaculture design elements may be included.
- **Certified Organic** – Is a formal prescriptive growing system. Can be carried out in rural or urban environments and refers to the method of food growing. It prohibits the use of synthetic chemicals and aims to protect animals and recycle organic residuals.
- **Distribution channel** - is a chain of businesses or intermediaries through which a good or service passes until it reaches the final buyer or the end consumer. Distribution channels can include wholesalers, retailers, distributors, and even the Internet.
- **Market gardens** – Grows vegetables on a commercial scale and will normally be located in peri-urban environments. Growing methods can be chemical or organic. Produce either sold directly to local consumers or via local supply channels.
- **Permaculture** – This refers to a broad design system that includes spaces, structures, energy, transport, ecology, food growing and community. Appropriate aspects of permaculture may be included within design and management of urban food growing spaces of any scale, where they are not already part of any certified organic growing system.
- **Regenerative agriculture** - An approach to food and farming systems that rejects pesticides, artificial fertilizers and aims to regenerate topsoil, increase biodiversity, improve the water cycles, enhance ecosystem services, increase resilience to climate fluctuation and strengthen the health and vitality of farming and communities. Organic and biodynamic food growing and some aspects of permaculture can be included in the scope of regenerative agriculture.
- **Stakeholders -** a person or persons with an interest or concern in something, especially a business.
- **Sustainable agriculture** - a type of agriculture that focuses on producing long-term crops and livestock while having minimal effects on the environment. This type of agriculture tries to find a good balance between the need for food production and the preservation of the ecological system within the environment. Inputs are generally organic i.e. non synthetic.

- **Urban agriculture** – Food produced within urban areas and consumed by or marketed to consumers within that urban area. It mostly covers vegetables, herbs and fruits and at present food growing can include farming on a commercial scale. Food growing methods tend to be mostly regenerative. Food growing can be carried out at household gardens, community non-profit gardens (schools, retirement villages and public land) and on commercial scale farms (urban farming). Bees, aquaculture and poultry chickens are also commonly included in urban agriculture. Supporting habitats for beneficial insects is an important aspect of the biological methods used in urban agriculture.
- **Urban farming** – Food grown in cities and urban environments, but more likely refers to food growing on a commercial basis where a level of sustainability is sought with economy, ecology and community. Millen Farm is an example of an urban farm.
- **Vertical Farming** - Is the practice of intensely growing produce in vertically stacked layers in buildings and structures. The practice can use soil, hydroponic or aeroponic growing methods. Vertical farms attempt to produce food in challenging environments, like where arable land is rare or unavailable such as cities and densely populated areas.

1 Introduction

Urban Agriculture is experiencing unprecedented interest and adoption in Queensland. This is being driven by a convergence of factors such as land use, lifestyle and community desire to access fresh, traceable, quality food. As Queensland's population grows and competition for land increases or vacant land in urban areas is left under-utilised, urban agriculture is increasingly being considered.

1.1 Guideline purpose

These guidelines have been developed to assist key decision makers and urban farmers to identify factors that may need to be addressed when establishing or conducting an urban agriculture enterprise. Please refer to the definitions section (pp a, b) for what this guideline considers as "Urban Agriculture". The scope of these guidelines is designed to incorporate commercial scale operations and not hobby farms, community gardens or residential size gardens.

As urban agriculture is conducted in areas surrounding or within urban communities there is potential for urban agriculture to impact nearby communities and environment. These guidelines therefore address the factors that can assist Urban Agricultural enterprises to establish and succeed in an urban environment. The guidelines have been developed using a combination of expert opinion, stakeholder consultation and a review of existing guideline documents from around the world (see section 4). This document is intended to be used as a guide to assist in identifying important factors and to locate supporting resources.

1.2 Discussion paper feedback

The development of these guidelines is influenced by comments provided to a discussion paper that was developed and circulated to key stakeholders for input. These comments were aggregated and used to inform the development of these guidelines along with other sources previously mentioned.

1.3 Types of Urban Agriculture Structures

- **Freehold** (Farmer owns the land on which the urban agriculture operation is to be conducted)
- **Lease** (Farmer leases the site from a third party)
- **Developer Initiated** (Developer may select and contract a farmer/s to occupy a developed site)
- **Community Initiated** e.g. councils (Community or Council selects and contracts a farmer/s to occupy a site for urban farming)

Each of the above structures can then be categorized into retail or wholesale for development application, licensing and permitting requirements. For Developer Initiated and Community Initiated projects, it is essential that consideration is given to tenant farmer expectations. These guidelines will assist Developer and Community projects manage expectations and responsibilities of the tenant farmer.

2 Establishing an urban agriculture operation

2.1 High level principles

2.1.1 General principles of establishing sustainable urban agriculture

Urban agriculture should integrate the main principles of sustainability such as:

1. **Environmental health:** Sustainable urban agriculture is supportive of environmental health in that it involves low input of water and low to no use of fertilizers and pesticides.
2. **Economic profitability:** Short supply chains inherent in sustainable urban agriculture can reduce transportation costs of shipping between local producers and produce markets.
3. **Social wellness:** Sustainable urban agriculture provides opportunities for social interaction and individual recreational opportunities.
4. **Circular Economy:** The use, recovery and regeneration of recycled materials, products and materials at the end of each service life.

The following table list the benefits and impact of urban agriculture

Table 2.1 Benefits & impacts of sustainable urban agriculture

	Sustainability	Benefits/impacts
1	Environmental	***Pollution*** • Urban planting helps clean up the air and water and builds resilience of aquatic environment. • Reduces heat reflection and noise in urban areas. • Recycles urban waste and uses it as nutrients for the plants. ***Biodiversity*** • Protects and improves biodiversity of urban areas. • Increases ecosystem resilience. ***Climate change*** • Reduces global heat and improves microclimate. • Sequesters carbon in the soil.
2	Economic	***Creating avenues*** • Creates employment opportunities. • Increases business and expands urban economies. ***On-farm benefits*** • Returns higher yields from the land. • Reduces transportation costs (i.e. food miles).
3	Social	***Community engagement*** • Community development/building social capital. • Increases awareness, education and youth development, and recreational opportunities. • Creates food security and access • Increases access to land
4	Health	***Social health*** • Supports better health and fitness. • Provides good food and health literacy • Improves overall well-being (Mental Health and Physical Activity)

2.1.2 Concept development

When conceptualising an urban agriculture enterprise there are many aspects to consider. The checklist below is based on the guidelines in this report and provides important considerations when establishing an urban agriculture enterprise.

- ☐ Do you have or can gain custody of the site?
- ☐ Are you likely to be retailing from the site?
- ☐ Is the site likely to be approved by planning and regulatory authorities?
- ☐ Do you have a farm/plot/ site plan or site layout?
- ☐ Do you have a business plan for the enterprise?
- ☐ Have you conducted a site survey of soil type/s and access to any available water supplies (2.1.7)?
- ☐ Are there adequate buffer zones from neighbouring properties and utilities?
- ☐ Have you developed an Environmental Effects Statement?
- ☐ Do you have food safety licensing?
- ☐ Do you intend to have public access (s2.2)?

2.1.3 Venture structure drivers

Key drivers of the venture can include developer initiated, community initiated, mix of community and social entrepreneurial, government lead and entrepreneurial driven. The type of enterprise initiator will be important in the chosen structure and method of operation of urban agriculture ventures.

2.1.4 Collaboration partners

A collaboration plan for the enterprise is essential for establishing urban agriculture. The collaboration partners can include technology experts and hands-on growers, farming companies, research facilities, community education, schools and universities, developers and local councils. Platforms (including online platforms) that provide innovative agricultural solutions are helpful to locate collaboration partners.

For instance, The Department of Environment & Science has worked with The Centre for Recycling Organic Wastes & Nutrients (CROWN) to coordinate research conducted into organics and nutrient recycling www.agriculture.uq.au/crown. The Centre for Organic Research & Education (CORE) also has a network of potential collaboration partners through its Sustainable Amendments for Agriculture (SAFA) program www.core.asn.au/agriculture.

New and existing enterprises can also collaborate with other farms in their district to offer a wider range of products at markets and stalls and/or share their experiences.

2.1.5 High level cropping plan

A high-level cropping plan will identify potential income from the urban agriculture space at various stages and help greatly with early decisions on viability and scale. Plans typically use production per square metre metrics that can be improved over time with appropriate organic practices. There are a number of models available using spreadsheets, developed by farmers for cropping plans
(e.g. https://urbanagriculture.horticulture.wisc.edu/crop-planning/). Distribution Channel(s)
The intended distribution channel should be considered in the early developmental stage. Distribution channels include direct to the public (retail), direct to resellers & agents (wholesale) or through restaurants and food manufacturers (trade).

2.1.6 Water supply

An urban agriculture enterprise should identify potential water sources and estimate yearly water usage based on the high-level cropping plan. A water balance model should be developed to ensure adequate water supplies are available for the enterprise.

Various water conservation initiatives are discussed in the Water Management section 2.4.2 of these guidelines that can optimise water usage and reduce consumption.

2.1.7 Urban food gardening support

The enterprise can contribute to the wider adoption of urban food gardening and this can be carried out through activities such as education and community engagement. This can be achieved through initiatives such as “open days”, school excursions and farm trails to give the broader community an understanding of urban farming.

2.1.8 Governance principles

Governance Principles that can be adopted for urban agriculture include:

- Participation
- Rule of law
- Transparency
- Responsiveness
- Consensus and collaboration management practices
- Equity
- Effectiveness and efficiency
- Accountability
- Strategic vision

For larger developments that are integrating multiple urban agriculture enterprises a managing entity consisting of the farmer(s) and the developer(s) may be required to ensure governance and overall management of the ventures is well maintained.

More information about governance principles can be found at http://www.gdrc.org/u-gov/g-attributes.html

2.1.9 Food Safety

The governance measures should ensure the food growing meets food safety standards, regulations and legislation. Food safety is regulated in Queensland by Federal, State and Local legislation.

https://www.health.qld.gov.au/public-health/industry-environment/food-safety/requirements

For organic growers there are accredited certifying bodies that can help manage food safety. These include:

NASAA: https://www.nasaa.com.au/
ACO: www.aco.net.au
OFC: www.organicfoodchain.com.au

There is also an Australia Organic Standard that addresses food safety elements.
www.agriculture.gov.au/ag-farm-food/food/organic-biodynamic

2.2 Land access

2.2.1 Key land use principles

Key land use principles and observations include:

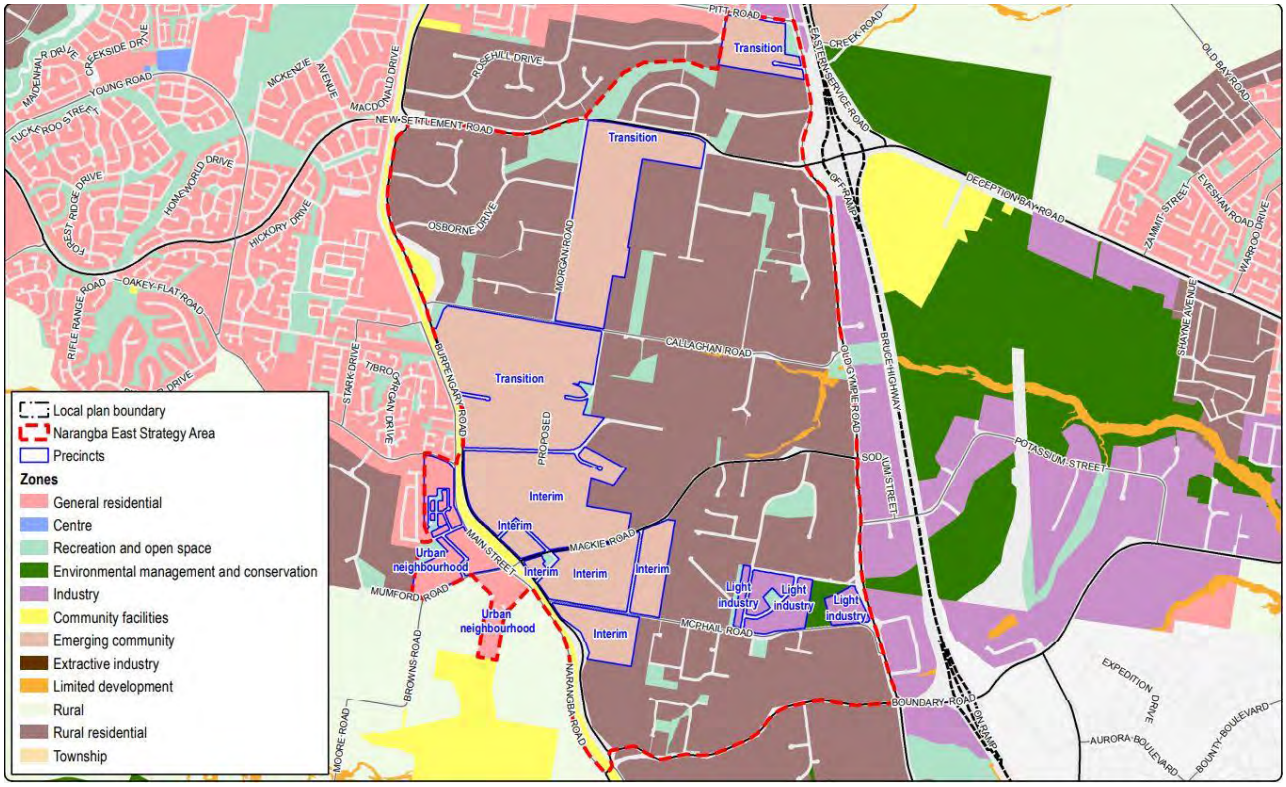
a) Land normally not owned – Given the high cost of urban and peri-urban land, it is normally not economically viable to buy land for urban farming. Thus, most urban farming is on public land or private land that cannot be used for anything else in the medium to longer term.

b) Low-cost land leases with offset benefits to land owners either private or publicly owned land – Where private or public land is used in urban environments, the land rents would not be the same as normal land rents, they would be lower. Given this lower rent return to the land owner, the urban farm needs to express other values going to the land owner such as: local community and ecological/environmental benefit, new employment and potential for circular economies principles to evolve in a very local way. In property development the urban farms can improve sales rates and increase land values due to creating “an “attractor”, on roof tops property owners can received significant reduction in power usage and roof top maintenance

c) Resource collaboration – urban farms have enhanced opportunity to attract support and resources from collaborators because their mode of operation tends to be multi-faceted with a strong focus on local community benefits and environmental awareness in addition to its economic aspects with significant economic multiplier potential

2.2.2 Zoning

A primary consideration when establishing an urban agriculture venture is whether the activity is permitted in the designated zoning for the location. The Queensland Department of State Development, Manufacturing, Infrastructure and Planning have overarching planning responsibility in Queensland. More information can be accessed through Queensland's Planning System at www.planning.dsdmip.qld.gov.au. Local Governments then have specific Planning Scheme Maps that identify the various zoning areas.



2.2.3 Approvals process

Development Applications may be required to gain approval for specific sites. These will likely vary from local government to local government and consultation with your local council is recommended to acquire the necessary development application information. An independent planning consultant may be utilized to assist with development application, as they often understand what development is possible and ways to address any challenges the applicant may face.

If the venture is part of a larger Development Application, then the urban agriculture portion will usually be incorporated by the larger developers planning team with assistance from a farming expert.

2.2.4 Private land access

If the site is to be leased from a third party a formal lease agreement will be required to gain site access. There are standard template lease agreements available that may be adapted for agriculture application, however, use of a legal advisor is suggested. Previous land use history can be investigated to ensure there are no known adverse impacts. If there is any uncertainty it is advisable to conduct soil testing (see appendix 1.).

2.2.5 Public land access

Public land access is a more complicated process that may involve competitive bid processes and more intricate agreements to protect the public's interests. It may also require multiple stakeholder approval or sign-off.

Check previous land use history to ensure there are no adverse risks (e.g. sheep dipping station, vehicle wreckers, landfill site etc.) and if unsure it is recommended that soil testing be conducted.

2.3 Community engagement factors

2.3.1 Getting community support

- Build a supporter base, methods and ideal processes to keep community on side, using physical and virtual methods.
- Engage key stakeholder and supporters.
- Awareness of collaboration techniques is very helpful.
- Define core community benefits within this aspect of the planning phase is essential as these can be targets to be measured and used to build and reinforce community confidence.
- Establishment of a Community Reference Group may be advisable in larger scale developments.

2.3.2 Managing group

A professional facilitator may be required with key skills in managing group dynamics and communication with open disclosure to local stakeholders. This group may also be involved in business plan development.

2.3.3 Embedding community into viability

The local community is a potential customer base for produce and services. Strong awareness is vital to establishing productive relationships between community, workers and customers.

2.3.4 Communication plan

Plan the method and frequency of regular communication to supporters, subscribers, customers and suppliers. This helps to maintain regular cultivation of community relationships. Online tools can be helpful.

2.4 Environmental Factors

2.4.1 Environmental Factors

The Queensland Environment Protection Act (1994) and updated amendments is the legislative policy that addresses environmental factors at a state government level.
(https://www.legislation.qld.gov.au/view/html/inforce/current/act-1994-062).
Some developments containing urban agriculture may be required to conduct an Environmental Effects Statement for these activities. The following are areas that generally need to be addressed.

2.4.2 Air

Ensure that urban agriculture operations do not cause odours or reduce air quality. Common factors that may need to be addressed include:

- Odours from input materials such as manures and preparations
- Spray drift from applying sprays to crops
- Excessive smoke from farm machinery
- Odours from decomposing produce

Consideration should also be given to climatic factors such as wind direction/speed and inversion layers or proximity to boundaries and neighbouring properties.

2.4.3 Water Management

Water management is crucial in urban agriculture as access to conventional farm water reserves such as dams, rivers and aquafers may not be possible or permitted in urban environments. City water supplies may also be cost prohibitive. Consequently, water harvesting/recycling, soil moisture holding efficiency, mulching and crop selection considerations will need to be addressed. Studying local rainfall patterns and average rainfall events for the site is also a primary consideration. Climate change impacts will also need to be addressed.

Water Sensitive Urban Design (WSUD) principles may need to be adopted to address site run-off (refer to Health Waterways – *Water by Design Manual* www.hlw.org/initiatives/waterbydesign. Should the project decide that a sustainable media made from recycled materials is a preferred option, then products meeting CORE's *Performance Based Specifications for Organic Biofilters* should be used (available at info.core.asn.au). Underground infiltration tanks could be coupled with biofiltration systems for treatment and water harvesting. To prevent polluted sub-surface water entering surrounding waterways and aquafers (see www.hlw.org) a "bioreactor" trench containing an advanced biofilter media can be installed.

2.4.4 Soil Health & Management

Soil health and management is critical to many environmental factors as well as influencing plant health and crop yields. Soils containing greater than one percent by weight (preferably higher) of organic matter have been proven to reduce soil erosion by water and wind. Higher organic soils also help lock in nutrients for plant availability thus decreasing synthetic fertiliser requirements and reducing nutrient run-off. Established organic soils can reduce water usage by up to fifty percent and ameliorate soil temperature fluctuations.

When establishing an urban agriculture project, it is advisable to conduct initial and ongoing soil testing and analysis (Appendix 1) to check organic matter levels, soil structure and soil chemistry. Maximising productivity, sustainability, food quality and production security require the building of soil life and progressively improving it with organic methods such as using compost, green manure, liquid manure etc. This can be done on site or supplied by a local manufacturer. Consideration can also be given to implementing a formal organic system such as organic and/or biodynamic certification.

2.4.5 Biodiversity balance

Endeavour to create a farm space design that facilitates a diversity of soil life, insect and bird life and native animals to create harmony with food production. Where possible preserve areas of native habitat or include new areas when planning urban agriculture sites. Incorporate local native plant species where possible to encourage local fauna.

Ensure crop species do not encroach on surrounding habitats and take urgent action with diseases in the cropping area that could harm surrounding flora. Organic systems can significantly improve pest and disease control.

2.4.6 Noise

Where animals are included in farming operations consideration needs to be given to noise impacts. This can be mitigated by housing animals in structures that are sound proofed.

2.4.7 Waste Management

The Queensland Government has a draft Waste Reduction and Resource Recovery Strategy https://www.qld.gov.au/environment/pollution/management/waste/recovery/strategy and also, the Transforming Queensland's Recycling and Waste Industries Paper,

https://www.qld.gov.au/ .../transforming-qlds-recycling-waste-industry-directions-paper...
These policy documents encourage resource recovery and waste reduction initiatives. There are a number of areas that urban agriculture has the potential to generate waste materials including;

- Organic crop residuals
- Packaging from input products such as cardboard, plastic containers, plastic film & glass.
- Replacement machinery parts and tyres
- Unused preparations and treatments (replace with "Organic based liquid fertiliser prepared or stored in small quantities securely on site at urban farms. At times these may need to be disposed of if they are out of date"

Low quantities of organic crop residuals can be composted on site using a range of composting systems such as bin systems, windrowing and small enclosed systems. For larger volumes, a commercial composting facility that is licensed to take these materials can be used. CORE has developed "*Guidelines for On-Farm Composting Operations*" that addresses on-farm processing of organic materials, contact info@core.asn.au. Using recycled organics from on farm composting operations or from commercial composting facilities has proven to have multiple environmental benefits for farmers and the wider community. These include:

- Reduced water consumption.
- Reduced landfilling of organic materials.
- Reduced landfill costs ($75/tonne levy applicable from July 1 2019.
- Reduced chemical fertilizer usage.
- Reduced soil borne diseases.
- Reduced soil temperature fluctuations.
- Increased soil biology.
- Increased productivity & yields.

For details of commercial suppliers of recycled organic products, contact info@core.asn.au.

Packaging waste should be recycled at transfer stations or commercial recycling facilities. Farm operators may also be able to influence product suppliers to reduce their packaging.

Machinery parts can be recycled at metal recyclers or some transfer stations (conditions may apply) and tyre suppliers generally have taken-back schemes for used tyres.

For unused preparations and treatments, seek the manufacturers' advice on safe disposal and storage requirements. These include take-back and product stewardship schemes available through the Queensland Farmers Federation. https://www.qff.org.au/advocacy/recycling-and-materials-recovery-opportunities/

2.4.8 Energy Consumption

Energy conservation measures should be fully considered as they can reduce energy consumption and reduce operational costs. Installing LED lighting and solar power for sheds and stalls can also be an advantage if connection to main power is costly or not available.

As mentioned previously, maintaining adequate organic matter levels can reduce water needs, which in turn can reduce energy costs if farms are irrigated using pumps. In some cases, resultant irrigation frequency reduction by as much as fifty percent has enabled farmers to reduce their energy costs by up to $1,000 per hectare for each crop rotation.

Proper consideration should be given to fuel efficiency when selecting farm machinery. This has an obvious environmental benefit from reduced emissions but also has an economic benefit through reduced fuel consumption. Soils with adequate soil organic matter levels support no till practices that have been shown to assist farmers by reducing fuel consumption by avoiding or reducing tilling and ploughing. (SAFA Farmer Survey, 2015)

2.4.9 Organic growing methods

Organic and Bio-Dynamic farming methods can provide an attractive option and safeguard against impacts on the surrounding environment. Consideration should be given to whether formal certification or merely the use of sustainable or regenerative agriculture methods are more viable options considering the cost of certification. Organic and biodynamic systems can create a point difference to supermarket food, enhance the local environment and tap into community health awareness and also reduce inputs usage and finite resources.

2.5 Design aspects

2.5.1 Size and scalability

Farming plots should be integrated into the overall landscape design and could be accommodated in flexible, non-rectilinear forms. The design of plot areas should encourage social interaction by balancing a variety of different uses in the common outdoor amenity space.

2.5.2 Layout of farm spaces

The farming method and people- friendly layout can have a big impact. Site layout could consider provision for some community allotments connected to the farm space.

2.5.3 Beauty and functional aspects

In the detailed design of the plot areas, equal emphasis should be given to both beauty and function when considering the cropping layout and other factors relating to the space.

2.5.4 Community and Accessibility aspects

To foster community involvement and support, consideration should be given to how the urban farm design and operation can enable reasonable access for the general public and people with disability.

2.5.5 Infrastructure aspects

Water, power, waste management and recycling structures, people, vehicle access and parking are to be considered.

2.5.6 Integrating Organics Recycling into Design

As described in section 2.4.7 Waste Management, recyclable organic materials are generated as a result of farm operations but these can also be used as an input to sustainable, regenerative and organic farming practices. Therefore, the management of these materials should be addressed in the design phase to ensure issues such as adequate space for storage (e.g. compost) and location of recycling equipment is properly considered.

Depending on the locality of the farming operations to surrounding communities and the type and volume of residual organic materials to be managed, an enclosed composting system may be required and designed into the site layout. There are varying size of enclosed systems including modular systems. Storage bins may also be required to efficiently store product before application to land.

2.5.7 Irrigation and drainage

The design should include lower level design of water supply and irrigation systems, in addition to ensuring the site layout, bed design and planting incorporates best practice drainage practices. Refer to section 2.4.7 Water Management for information on Water Sensitive Design Principles that can be adopted for managing drainage from the site. A re-circulating treatment and re-use system can be installed to conserve water resources.

2.5.8 Starting soil

Carry out soil analysis (see appendix 1) with expert help if necessary to ensure suitability for the desired cropping selection. Soil remediation or amendments may be necessary.

2.5.9 Incorporating public safety into design

From both regulatory and community engagement perspectives, the design should comply with public safety requirements relating to food production, its sale, site visitors and workers/volunteers (see S 2.6.6).

2.6 Business planning

2.6.1 Create a staging plan

The staging plan should cover food production spaces as well as other activities such as education, farm tourism, market days, food value adding, restaurant, seedling and soil additive production and sale.

2.6.2 Customer/member profiling

Identify as many potential customers as possible, conduct surveys of their product needs and subsequently establish key crops that will meet those needs. This will ensure viability of the enterprise.

2.6.3 Physical resources

Identify and develop detailed descriptions of all hard infrastructure required on site and establish where it will be sourced (ideal if second-hand and donated to reduce cost). Total costs should be established.

2.6.4 Land access & tenure

Depending on land source, negotiate reasonable tenure on the land to give the farm potential to reach its goals. A minimum 5-year leases with extensions, ideally a 20year lease is recommended. Ensure lease payment is compatible with the enterprises production economics and return on investment.

2.6.5 Staffing

Staffing includes full time, casual and/or volunteer staff members. It is important that all staff are experienced or trained in their roles and understand how their actions can impact on the enterprise's social and environmental responsibilities (as outlined in 2.4 Environmental Factors section).

2.6.6 Insurances

Ensure that all necessary insurance policies are purchased including Public Liability and Workers Compensation insurance. Other insurances include Business Insurance, Motor Vehicle and Product Liability insurances.

2.6.7 Cash flow and funding projections

Establish spreadsheet tools that enable cash flow projections based on staging, capital start up, income and cost projections from operations. Guidance and templates can be found at https://www.business.qld.gov.au/industries/farms-fishing-forestry/agriculture/agribusiness/agbiz

2.6.8 Business plan

A business plan should be developed that includes (*inter alia*) the information contained in these guidelines. A business plan template that may be useful can be found at:

https://www.business.qld.gov.au/starting-business/planning/business-planning/business-planning-kit

2.6.9 Business management technology platforms

The enterprise should consider using technology platforms such as farm management, customer management (CRM), social networking, accounting and promotion (see https://www.qff.org.au)

2.6.10 Networking and collaboration

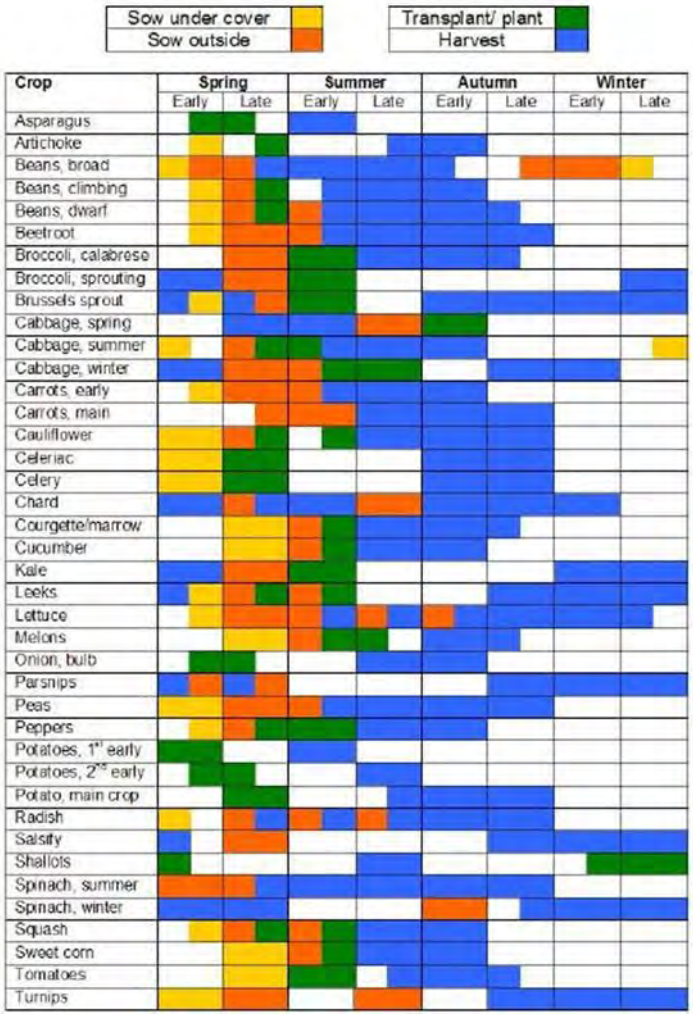
Networking with other urban farmers as well as experienced market gardeners is considered fruitful. Active collaboration with for profit and not for profit enterprises, government and individuals is recommended particularly where shared benefits are advantageous.

3 Operating an urban agriculture venture

3.1 Cropping

3.1.1 Cropping plan for all spaces

A cropping plan must be driven by customer needs and ecological plantings. This plan should also include staging and be regularly updated. Consider using online grower management platforms. A planting calendar will also assist (see example below).



3.1.2 Crop and yield monitoring

Keep records including all plantings, harvesting, sale values, pest and disease attrition, lost crops due to non-sale, yield per square metre so this can be compared and continuously improved over time. Online tools (e.g. grower management platform) can support monitoring and grower community sharing.

For smaller cropping areas it is essential to maximise the yield and value per square metre of cropping area. Quick turn over crops could be preferable and where possible avoid devoting full cropping areas to crops that have long lead times to harvest.

3.1.3 Plant management

Plant management includes planting and plant management for harvesting and pests/diseases using grower management platforms.

3.1.4 Establishing ideal crop sources

Selecting high quality sources for seeds, seedlings, bushes and trees is vital. Local propagation and self-incorporated propagation sources are preferred.

3.1.5 Supply Chain Considerations

Determine the supply chain based on business scale and customer locations. Give due regard to the nature of urban agriculture which should generally be short supply chains between grower and customer. Identify how to deal with supply chain(s) in a more collaborative way.

3.1.6 Reporting and monitoring

Make use of reporting tools for cropping, production, harvest, yield and profit, as well as community engagement, soil and ecology improvement. It's important that volume, yield, soil improvement and community engagement statistics can be shared with the local community so they can see how things are progressing. The grower management platform should have these capacities.

3.2 Soil Monitoring

3.2.1 Establish regular soil monitoring practices

Monitoring methods need to be based on a known starting point (baseline) with a plan to customise and improve soil for its specific food growing purpose and then tracking progress. Some expert advice may be required. Check soil organic matter levels annually as a minimum.

3.2.2 Create rotation for beds and monitor

This requires seasonal knowledge and crop rotation skills, plant management knowledge resources. Spreadsheet or online tools could be made available to assist with this recording and tracking. This can be found in a grower management platform.

3.2.3 Carbon sequestration impact

As a result of the addition of organic materials (e.g. recycled organics), soil carbon levels will increase. Measuring these increases may lead to an income source for the farm if carbon credits from farming activity can be objectively monitored and then monetized. For small scale enterprises it is recommended that the viability of pursuing these credits needs to be established.

3.3 Customer management

3.3.1 Implement communication platforms

Platforms such as social networks, web site and online grower management, can make it very efficient to easily communicate with existing and prospective customers.

3.3.2 Customer/community events

Build the local food culture around the farm using community events to create awareness and engagement. Where possible link farm visits with local events through dialogue with local information or tourist centres. Prepare a leaflet that is Dimension Lengthways (DL) in size that can be issued accordingly.

3.3.3 Customer/member order management systems

Implement online systems to reveal stock status, handle orders, invoicing and payments and keep a customer history. This should be included in the grower management platform and/or Customer Relationship Management (CRM) system.

3.3.4 Local customer development

Develop a very strong focus on getting local community supporters to be customers, covering individuals, businesses and organisations. Conduct letterbox drops or put advertorials in local newspapers/ local retail outlets inviting people to the enterprise.

3.3.5 Customer profiling

It is vital to make it easy for customers to provide feedback as quickly as possible on how doing business with the urban farm enterprise is progressing, especially important where sales are to local restaurants. This feedback system could be included within the grower management platform or CRM.

3.4 Environmental Compliance Monitoring

3.4.1 Environmental Compliance Monitoring

Use the Environmental Effects Statement (S2.4) to monitor compliance with environmental regulations and requirements. An independent environmental auditor may be required for larger sites. Establish rapport with a nearby property owner(s) and request that they contact you if there are concerns about farm activities that are impacting them. For larger operations, perhaps establish a “hotline” for nearby residents to call if they wish to report an environmental issue.

Apart from soil testing, conduct tests on onsite water and runoff at regular intervals and/or water coming onto the site if the operation is being impacted by surrounding sites. Suggested parameters for water testing include:

pH & Electrical Conductivity

Chemical Oxygen Demand

Biological Oxygen Demand

Nutrients

Heavy Metals

Bacteria

Total Suspended Solids

Review packaging from suppliers and constantly check for innovations in packaging for selling produce. Ensure waste is properly managed and disposed of and that packaging and other recyclables are properly recycled.

3.4.2 Environmental impact measurement

Institute adequate recording methods and work with accredited laboratories or researchers through universities to assist with proper measurement so that a true objective analysis can be undertaken.

3.4.3 Environmental Regulation Updates

Check for updates to environmental regulations that may impact operations. This may necessitate an update to the Environmental Effects Statement if it is being used for environmental monitoring purposes.

3.5 Ongoing Community Engagement

3.5.1 Community Reference Group

If a Community Reference Group has been established, make sure a farm representative is in attendance during meetings, to answer questions or clarify any issues that may be raised.

3.5.2 Measuring benefits

Based on desired community benefits within the planning phase, ensure methods of measuring benefits are established for reporting to the community.

3.5.3 Managing an expanding community

After building a successful urban farm within a local area, other ventures are likely to start and the area may become one where farm tourism develops. Consequently, the community of the urban farm enterprises can expand which may require adaptation. Gaining an understanding where its reach is spreading and strategies to manage and optimise this growth need to be developed.

4 Additional Resources & Organisations

Information on urban agriculture sites, resources, organisations, government frameworks and regulations from Australia and internationally are shown below.

Name	Comments
Funding	
Food Agility CRC	Collaboration of universities with large funding pool to be focused on creating online resources and tools for food production in agriculture.
Government regulations & support	
City of Yarra	Comprehensive Urban agriculture strategy for the City of Yarra with very helpful checklists.
Milan Food Project	European venture to develop guidelines around food security in urban environments
Melbourne Food Plan	Food policy for Melbourne, very useful city-based framework which includes supporting local food growing, excellent statistical analysis
Urban food systems – a renewed focus for local government in Australia	Research project from University of Queensland with analysis of how local governments in Australia can become more involved in sustainable food systems which incorporate urban agriculture
Bristol Food Policy Council	Great example of a UK local government with comprehensive support program for sustainable local food systems
USA Department of Agriculture – urban ag resources	Large set of information resources and services from the USA Federal Department of agriculture to support urban agriculture
New York City – urban agriculture	Range of resources from New York City Local government to support urban agriculture
Vancouver Urban Agriculture policy	Great set of resources on one of the most progressive cities in the world with urban agriculture and very strong government support
Michigan Urban Farming initiative	Highly developed urban farming operations in Michigan, USA
CRC for Precision Agriculture	Food system research
Economics of ecosystems and biodiversity with food systems	Comprehensive global research on food systems, provide many useful resources and context for food system transformation
Advocacy Organisations	
Australian Food Sovereignty Alliance	Australian advocacy organisation supporting farmers, gardeners and consumers
Sustainweb	UK advocacy and information provider on creating a more sustainable food system. Great information resources
Urban farming business planning	
Urban farming tool kit	Excellent resource from USADA on planning an urban farm
Organics Recycling	

Name	Comments
The Centre for Organic Research & Education (CORE)	Established in 1997 CORE is dedicated to the beneficial reuse of recovered resources in the circular economy.
Centre for Recycling Organic Waste & Nutrients (CROWN)	CROWN is coordinating research into organic waste and nutrient recycling and is supported by the Department of Environment & Science
New York City organic waste recycling	Well-structured process for residents and businesses to deal with recycling of organic waste
Basel Urban Agriculture network	Largest community composting system in Europe for urban agriculture
Sustainable Amendments for Agriculture (SAFA)	A CORE led initiative established in 2004 to supply overflow processed material from community collection systems in NSW and Victoria. Over 150 farms have participated in the program providing low cost amendments and farming system adaptation.
Hilltop Alliance	Large scale multi-faceted urban farming venture for Pittsburgh property development

5 Appendix

5.1 Sample Soil Test

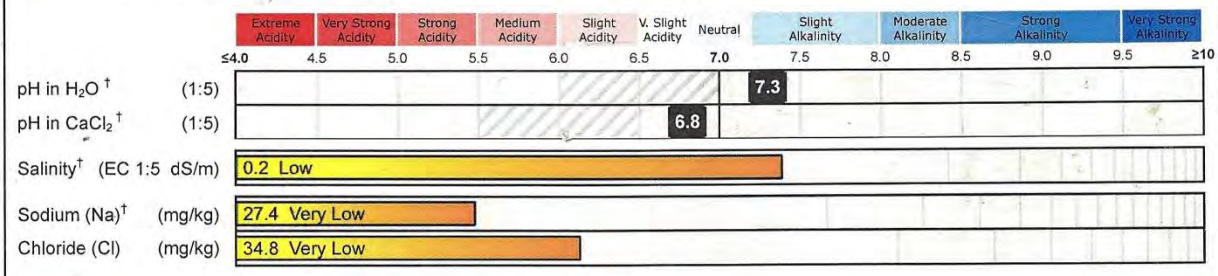
Batch N°: 27968A Sample N°: 1 Report Status: ○ Draft ◉ Final

Client Name:		Project Name:	Farm Soil Testing
Client Contact:		Location:	
Client Job N°:		SESL Quote N°:	
Client Order N°:		Sample Name:	Farm 1
Address:		Description:	Soil
		Test Type:	RSC

RECOMMENDATIONS

SOIL SAMPLE DEPTH (mm): ○ 100 ○ 150 ◉ 200 FERTILITY RATING: ○ Low ○ Moderate ◉ High

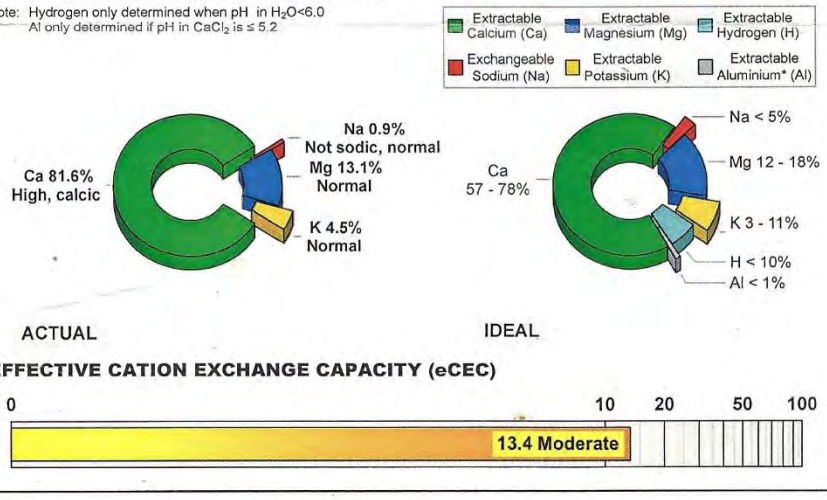
pH and ELECTRICAL CONDUCTIVITY



CATION BALANCE

EXCHANGEABLE CATION PERCENTAGE

Note: Hydrogen only determined when pH in H_2O<6.0
Al only determined if pH in $CaCl_2$ is ≤ 5.2



EFFECTIVE CATION EXCHANGE CAPACITY (eCEC)

CATION RATIOS

Ratio	Result	Target Range
Ca:Mg	6.2	4.1 – 6.0
Comment: Magnesium low		
Mg:K	2.9	2.6 – 5.0
Comment: Balanced		
K/(Ca+Mg)	0.05	< 0.07
Comment: Acceptable		
K:Na	5	N/A

Sodium Absorption Ratio: D.N.T.

Electrochemical Stability Index (ESI):
0.22 Low potential for dispersion and soil structure collapse

SOLUBLE CATIONS (meq/100g)

Na: K: Ca: Mg:

Batch N°: 27968A	Sample N°: 1	Date Received: 8/11/13	Report Status: ○ Draft ◉ Final

PLANT AVAILABLE NUTRIENTS

Major Nutrients	Result (mg/kg)	Very Low / Low / Marginal / Adequate / High	Result (g/sqm)	Desirable (g/sqm)	Adjustment (g/sqm)
Nitrate-N (NO_3)	51		6.8	13.3	6.5
Phosphate-P (PO_4)	778.6		207.1	16.8	Drawdown
Potassium (K) †	236		62.8	69.7	6.9
Sulphate-S (SO_4)	32		8.5	18.1	9.6
Calcium (Ca) †	2185		581.2	496.1	Drawdown
Magnesium (Mg) †	213		56.7	51.6	Drawdown
Iron (Fe)	-		-	146.8	
Manganese (Mn) †	-		-	11.7	
Zinc (Zn) †	-		-	1.3	
Copper (Cu)	-		-	1.7	
Boron (B) †	-		-	0.7	

Explanation of graph ranges:

Very Low
Growth is likely to be severely depressed and deficiency symptoms present. Large applications for soil building purposes are usually recommended. Potential response to nutrient addition is >90%.

Low
Potential "hidden hunger", or sub-clinical deficiency. Potential response to nutrient addition is 60 to 90%.

Marginal
Supply of this nutrient is barely adequate for the plant, and build-up is still recommended. Potential response to nutrient addition is 30 to 60%.

Adequate
Supply of this nutrient is adequate for the plant, and and only maintenance application rates are recommended. Potential response to nutrient addition is 5 to 30%.

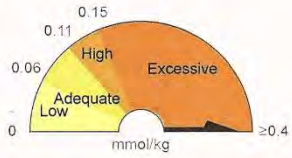
High
The level is excessive and may be detrimental to plant growth (i.e. phytotoxic) and may contribute to pollution of ground and surface waters. Drawdown is recommended. Potential response to nutrient addition is <2%.

NOTES: Adjustment recommendation calculates the elemental application to shift the soil test level to within the **Adequate** band, which maximises growth/yield, and economic efficiency, and minimises impact on the environment.

Drawdown: The objective nutrient management is to utilise residual soil nutrients. There is no agronomic reason to apply fertiliser when soil test levels exceed **Adequate**.

• g/sqm measurements are based on soil bulk density of 1.33 tonne/m³ and selected soil depth.

Phosphorus Saturation Index



2.91

Excessive. Exceeds environmental threshold. Implement improved P management to reduce potential for nonpoint P pollution.

Exchangeable Acidity

Adams-Evans Buffer pH (BpH):	-
Sum of Base Cations (meq/100g^{-1}):	13.4
Eff. Cation Exch. Capacity (eCEC):	13.4
Base Saturation (%):	100
Exchangeable Acidity (meq/100g^{-1}):	-
Exchangeable Acidity (%):	-

Lime Application Rate

– to achieve pH 6.0 (g/sqm):	0
– to neutralise Al (g/sqm):	-

Gypsum Application Rate

– to achieve 67.5% exch. Ca (g/sqm):	0

The CGAR is corrected for a soil depth of 200mm and any Lime addition to achieve pH 6.0.

Physical Description

Texture:	
Colour:	
Typical clay content:	
Size:	
Gravel content:	Not gravelly
Aggregate strength:	
Structural unit:	
Potential infiltration rate:	
Permeability (mm/hr):	
Calculated EC_{SE} (dS/m):	-

Requires EC and Soil Texture result.

Organic Carbon (OC%)[1]:	
Organic Matter (OM%):	-
Additional comments:	

Centre for Organic Research & Education

URBAN AGRICULTURE CASE STUDY

CERES ENVIRONMENT PARK - EAST BRUNSWICK, MELBOURNE

PROJECT BACKGROUND

The Ceres Environment Park commenced in 1982 on a former quarry site and is located 5 km from the Melbourne CBD. Since that time it has evolved into an award winning multi-faceted enterprise with urban agriculture at its heart. It is now a beautiful oasis of fertility, education, healthy ecology, community engagement with a vibrant economic model.

Ceres now occupies 4.5 hectares of land and within that space it has organic food production areas, teaching spaces, community spaces and aligned services such as cafe, restaurant, nursery, education centre, food box scheme and organic shop. In total, there are 17 different business units within the Ceres's not for profit entity.

AGRICULTURE AND BUSINESS DESCRIPTION

The food growing areas include two market gardens and a large chicken run area. These areas occupy about 2 hectares of land in total. The balance of the land is used for services, community spaces and the various social ventures that operate within the Ceres entity. Food production is managed organically and these areas are often used within the educational workshops and courses, as well as for farm tours, school tours and volunteer days. The food box scheme draws in organic and bio-dynamic food production from smaller scale farmers on edges of Melbourne and with food grown on site. This combined food supply is also used in the cafe, restaurant and organic shop on site.

For the 2019 financial year, the Ceres Environment Park in Melbourne will generate $15 million income, employs 150 people and receives 500,000 visitors for the year. Ceres has close relationships with 500 schools throughout Victoria, Ceres staff members go the the schools to run food growing and sustainability programs and the schools send 80,000 students to Ceres per annum. All these services provide significant income to Ceres and value add all other services provided on site.
Ceres is unique in Australia and globally for its scale and capacity to influence the urban agriculture and sustainable living movement. Its model has been instructive in the design of the Samford Parklands new urban agriculture initiative which have the potential to be larger in scale of food production, but perhaps not as large with yearly visits due to comparative size of cities and proximity to public transport.

Centre for Organic Research & Education

URBAN AGRICULTURE CASE STUDY

HORSLEY PARK PRECINCT, WESTERN SYDNEY

PROJECT BACKGROUND

Horsley Park Precinct is the largest area of proposed agriculture within the wider Western Sydney Parklands. The Precinct comprises 313 hectares west of Sydney, of which 34 hectares is bushland corridor.

Horsley Park Precinct sits within the central area of the Parklands with The Horsley Drive to the south, Westlink M7 Motorway to the west and Cowpasture Rd to the east. The Precinct is bound by the Motorway, industrial lands (Smithfield and Wetherill Park), private quarrying and brick making facilities and Prospect Nature Reserve. Horsley Park Precinct utilises significant volumes of excess, processed recycling organics from community collection systems around Sydney. The Precinct is comprised mostly of agricultural land which is part private and part owned by the New South Wales (NSW) government. Horsley Park Precinct will contribute to the long term target while demonstrating a model of urban farming on public land

AGRICULTURE AND BUSINESS DESCRIPTION

Established in 2015, the Horsley Park precinct has already attracted many farmers from diverse backgrounds, some of which own other farms nearby. A number of farms have setup road stalls and have become popular with locals and passersby's. The farms are also part of CORE's Sustainable Amendments for Agriculture (SAFA) programs that provides farmers with the recycled organic products. The soil onsite has a predominantly clay structure and recycled organics are playing a role in improving soil structure while reducing water needs and chemical fertiliser usage.

The Horsley Park Precinct is also strategically located near Sydney's new airport at Badgerys Creek where Sydney Produce Markets are also re-locating. This provides the precinct with an opportunity to export excess produce if necessary.

LOOP GROWERS - SAMFORD VALLEY, BRISBANE

PROJECT BACKGROUND

Loop Growers is an urban farming venture that commenced in 2015 and is located on fertile creek flat land in Draper, 5 minutes from Samford Village. The land is leased from the property owner Rob Peagram whose daughter Alice is one of the farmers with her partner Phil Garuzzo.

Loop Growers is a “Closed Loop” Farm. It works very strongly with its customers (20 cafes in Brisbane) to recycle organic resources, build community whilst focusing on healthy farm ecology with its organically produced food. The venture has established a multi-faceted income stream.

A key objective is to help each person that comes into the Loop to realise how intrinsically linked they are to what they eat, that decisions made regarding food choices and food waste can have a huge effect on lives.

AGRICULTURE AND BUSINESS DESCRIPTION

The farm has approximately 2 hectares of land and has cultivated 0.4 hectare. It organically grows vegetables, herbs and flowers and supplies them each week to its cafe customers. Minimum machine tillage of the land is done after initial land preparation and any further tillage is done by hand with broad fork.

The farm has set up its beds in quadrants with 8 x 20m long x 1m wide beds to a quadrant. The area between quadrants is grassy and this is cut by a slasher on the back of a tractor. The farm propagates all its own seedlings and only uses certified organic non-hybrid seeds with propagation in its large green house. The location does get winter frost and can also flood in the summer wet season, so these two factors provide additional challenges to crop and soil management.

With a group of dedicated Brisbane cafes, the farm diverts up to 2 tonnes of valuable organic resources from landfill each week from the cafes and uses it to grow produce on the farm. Yields, not waste, are collected and brought to the farm to be broken down using various composting methods. The biologically rich compost helps to build ecology in the soil, allows bio-intensive growing on a small 0.4 hectare lot where produce are grown and goes back to cafe businesses.

The farm sources volunteer labour from cafes where they actively engage their staff to get to know the provenance of the food they serve. Volunteers always leave with a box of food from the farm. The farm runs open days, educational workshops and corporate days for additional income. The farm gets paid by the cafes for farm produce in addition to collecting the cafes' green waste, achieving a close loop process.

MILLEN FARM - SAMFORD PARKLANDS, BRISBANE

PROJECT BACKGROUND

Millen Farm Ltd is a not-for-profit entity established in 2014 (1 year prior to first soil being turned at the farm in 2015). It leases approximately 0.7 hectares (ha) of land from Moreton Bay Regional Council at the Samford Parklands (20 kilometres (km) from Brisbane CBD). The entity has an objective of proving a model of bio-intensive sustainable organic farming of vegetables on land sizes from 7000m^2 to 1 ha, developing education systems and be a catalyst for wider adoption of those methods in urban and peri-urban environments.

The land was leased by Millen Farm to a farmer, Arran Heideman, in 2015 and it is operated commercially in line with Millen Farm objectives. The farm has strong community support, is productive and creates a living income for the farmer from sale of produce, buffered by educational income from a registered training organisation operating on site. Materials used at the farm are primarily locally sourced thus stimulating the local economy. The Millen Farm entity manages educational workshops and receives income from these workshops which is partly shared with presenters.

AGRICULTURE DESCRIPTION

Millen Farm horticultural practices are organic without using chemicals for cropping. The farm uses compost, minerals and liquid manures. The compost is mainly from Brisbane-based compost makers and over recent years has been purchasing approximately 100 tonnes of compost per year to build up soil. The farm also uses local chipped wood as mulch for the food forest border.

The 30m long vegetable beds at the farm are cultivated with a walk behind tractor only once per year (minimal till methods) and compost is laid onto beds by hand. The paths between beds are grass and these are regularly mowed to provide organic matter, as well as holding soil carbon, creating habitat for beneficial organisms and for ease of walking through beds since the strong community connection of the farm means there are always people walking through it.

The farm uses drip tape irrigation from its water tanks which are filled from town water, local river water and will soon be roof water from the site buildings nearby. Liquid fertilisers also run through the irrigation system. The site also uses a strategically positioned swale to spread roof run-off water underground to help with soil moisture.

With land usage, the farm has approximately 2000m^2 of bed area, 2000m^2 of food forest edge area and the balance 3000m^2 for paths and services.

BUSINESS

Millen Farm Ltd has received grants from local and state governments for farm infrastructure set up and the registered training organization (RTO) running horticulture certificates on site has also provided some infrastructure funding. The farmer has predominantly funded operational expenditure since all farming income belongs to the farmer.
The farm runs a market on site twice per week and other local producers have stalls at the market. This is well supported by the locals. The farm also sells to local restaurants and conducts local vegie box schemes. With the primary production income of the farmer being buffered from the educational income from the RTO, this has provided time and labour support for the farmer to build up soil and farming systems, thus creating a more sustainable platform for ongoing operations. This multi-faceted income is an important aspect of urban agriculture.

Centre for Organic Research & Education

URBAN AGRICULTURE CASE STUDY

NEW URBAN AGRICULTURE INITIATIVES - SAMFORD PARKLANDS, BRISBANE

PROJECT BACKGROUND

Following the success of Millen Farm, Moreton Bay Regional Council (MBRC) commenced investigating a range of additional urban agriculture activities at the Samford Parklands site in 2017. These investigations have resulted in a plan to open up at least another 4 hectares of land at the Samford Parklands and support the development of aligned industry to value-add the growth of urban agriculture on the site and into the Moreton Bay region.

A further 70 hectares of MBRC owned land in the MBRC region is also under consideration with the Samford Parklands initiatives being developed to become a catalyst and specialised knowledge centre for the urban agriculture movement. The proposed venture structure at the Parklands is oriented around facilitating local food entrepreneurialism with a mix of social for-profit enterprises becoming part of a cooperative and a management entity providing services to guide and support all urban agriculture enterprises on site.
The venture is currently in advanced planning stage and first agricultural activities are expected to commence in late 2019.

AGRICULTURE AND BUSINESS DESCRIPTION

The new agriculture initiatives will be focused on Australian native foods, fruit trees, herbs and flower growing. Growing methods will be oriented to regenerative agriculture with a core aim for each focus area to have a reasonable level of commercial viability from primary production and this will be supported by aligned industry activity. Each focus area would be operated by individual enterprises. The aligned industry to be developed within the buildings precinct of the site are: nursery, cafe, retail shop, eco-tourism, schools engagement, food processing, community outreach, education/research centre and urban agriculture innovation hub.

Conservative economic estimates at Year 10 indicate $3.5 mill gross income and 50 people employed at the Parklands site from the primary production and aligned industry activities. The synergy of the primary production and aligned industry activities will create strength in all ventures.

A special purpose enterprise is being established to guide the development of the concept so that is can scale activities to more land in the MBRC region and beyond. Based on scaling of the urban agriculture activities in the region, there will be potential in large scale use of recycled organics and industry development.