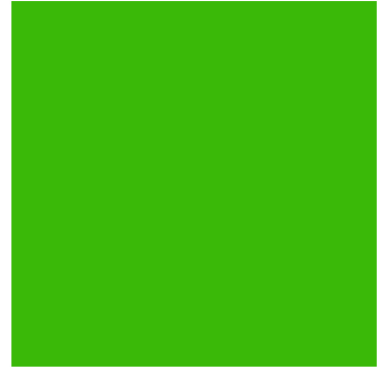


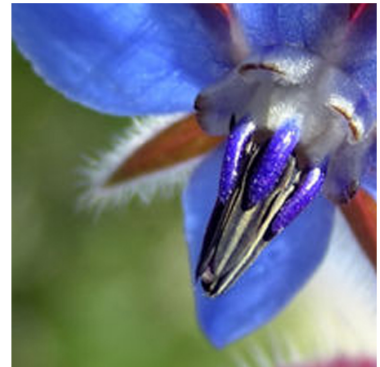
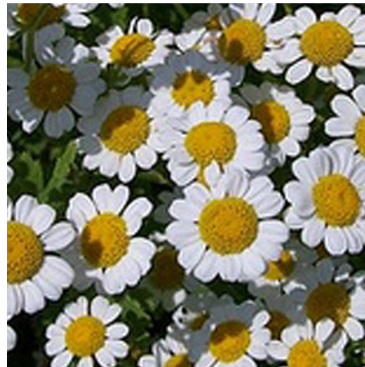
a project for **The Kindling Trust**



NON FOOD CROPS

Thomas Horne

Jack Morrison



Executive Summary

This report sets out by introducing the topic of non-food crops and the aims of our client, The Kindling Trust. Throughout the report, it relates the topic directly to The Kindling trust along with the clear objectives outlined at the start of the business partnership project. It then goes on to introduce the markets related to non-food crops, making use of both primary and secondary resources and highlighting the issues surrounding each research method that was used. It goes on to draw on our research in order to make recommendations related to non-food crops and The Kindling Trust in particular, highlighting relevant crops and future action that could be taken to meet the demands of the market. The report then finishes by concluding the findings and the research activity that took place to generate recommendations for The Kindling Trust, and evaluating our experience working with the client. The appendices include a complimentary slideshow that the client requested containing background information on non-food crops.

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Introduction

This report will explore and evaluate a wide range of non-food crops in terms of how they are used, their value across different areas such as in production of energy and bio-fuels, construction and the cosmetics industries and their potential value to The Kindling Trust in their future projects.

Agricultural crops are defined as non-food crops when ultimately they are not used for human or animal consumption. Over the past forty to fifty years many of the earth's natural resources have become diminished and increasingly scarce, which in turn has led to an upsurge in the importance of alternative resources. The challenge we are facing therefore is to identify relevant non-food crops across a number of sectors that are both accessible and beneficial to The Kindling Trust and its vision for a sustainable society.

We will present a profile of different non-food crops, display their advantages and disadvantages, and highlight on-shelf products to which certain crops have a production value. By agreement with our client we will present this information in a table to make it easier to digest. By evaluating each crop we will meet one of our aims set out in the plan of intention when undertaking this project; "to provide The Kindling Trust with a clearer, more detailed understanding of non-food crops, as well as highlighting on-shelf products that require non-food crops for their production".

Depending on the capacity of local growers, those seeking alternative materials can source from local producers in order to create links within their local community, bring costs down, and certainly present themselves to customers as being more socially responsible, or, 'green'. This has been a focus point for enterprises small and large in recent times, and many customers are increasingly seeking products that are produced in an ethical, socially responsible manner. The population is becoming increasingly aware of the importance of reducing carbon emissions, being sustainable and making efforts to recycle properly and minimising wastage where possible. This upsurge in 'green' consumer behaviour can be met by local social enterprises; providing they can meet the demands of the market quickly enough there is the potential to tap into a customer base that is willing to pay that bit extra to guarantee their products are ethically produced and retailed. Customers like to be associated with supporting local businesses (from a consumer standpoint) however this will be replaced by the convenience of supporting larger organisations if it becomes impractical or complicated (i.e. enterprises may lose business if they are continually out of stock of items a customer requires, organic, ethical or otherwise). Climate change is a hot topic in the modern day and although it is feared that climate change will damage the environment in irreparable ways, some sources we encountered have

Introduction

been less sceptical. According to Caroline Spelman, the Environment Secretary, climate change might actually be beneficial to the UK. In a speech at the Oxford Farming Conference, she said that, although problems such as droughts would become more frequent, warmer weather would also mean a longer growing season and less frost damage, allowing the introduction of crops such as peaches, maize and sunflowers. A study commissioned by the conference from the Scottish Agricultural College and published in The Daily Telegraph [1], suggested that the boost from a warmer climate could help Britain compete in the global market as production was reduced elsewhere.

Research Activity & Findings

Through our client meetings and email correspondence with our client, The Kindling Trust, we were able to agree on an overriding determined outcome for this project, which was quite simply to provide the client with as much information as possible regarding non-food crops, the products they are included in, and ensure this information is relevant to local growers and farmers. We agreed with our client at one of our interviews that the most useful way to present this information was through a portfolio that profiles a select few non-food crops, supplemented with relevant tables, pictures and charts, also including web links to where we retrieved the information (so that it can be accessed by the client if required). Then, based on the information we have gathered on non-food crops, we will make recommendations as to which crops are the most fancied and, additionally, how The Kindling Trust might be able to increase market demand for the products these non-food crops supply.

We deemed it was appropriate to use a range of both primary and secondary resources in order to ensure the crops we identified for The Kindling Trust were both appropriate and accessible. This is due to the seasonal nature of some non-food crops, as well as the reality that some uses of non-food crops are out of the reach of smaller enterprises (i.e. the need for specialist equipment when producing biofuels). In order to ensure the viability of our resources, we made a concerted effort to find publications from recognised sources such as national governments, academic journals and used articles from credible newspapers and online websites like that of the The NNFC (The National Non-Food Crop Centre) [2]. It is fair to say that we had trouble in obtaining up to date figures surrounding the non-food crops market as we were conducting mainly secondary research, but this was to be expected and was considered in our Plan of Intention. Due to the nature of our task (i.e. finding background information not up-to-date statistical information) the date of publication did not really hinder the completion of our project aims.

Our client, The Kindling Trust, has established successful partnerships with a number of urban social enterprises in the Manchester area, including Greater Manchester Food Army and the Manchester Carbon Co Op – both of which are involved in supporting local growers and farmers in strengthening their financial situation. They are also familiar with those involved with the 8th Day social enterprise, something we experienced first-hand whilst conducting our primary research when we visited the 8th Day shop on Oxford Road. We identified ourselves as students representing our client, The Kindling Trust, and informed them that we were conducting research, at which point the staff member was more than happy for us to ask her questions regarding on-shelf products. The store had a variety o

Research Activity & Findings

f products, ranging from pharmaceuticals, herbal remedies, and essential oils to environmentally friendly cleaning products. There were also bags of seeds on shelves that encouraged shoppers to plant their own flowers and so on, as well as a number of organic food crops on sale. This alerted us to the widespread potential number of products that local farmers and growers might be able to help produce for non-food crops (i.e. cosmetic products, clothing, arts and crafts materials such as paper and cardboard). It quickly became clear that whilst the 8th Day store was not targeting a mass market, there was a definite market requirement for their niche assortment of products, as evidenced by the busy nature of the shop where many customers were shopping. It is also important to note that on-shelf products are said to be produced in a more socially responsible manner, which allowed some items (i.e. shampoos, oils, cosmetics) to command a higher price.

Customers are becoming increasingly drawn to 'green' products and services in recent times in a bid to combat climate change and other social challenges, and seem more than willing to pay a little extra to support these causes. Many customers, therefore, will continue to choose to shop at local social enterprises such as Unicorn, 8th Day and The Veg People as they know that the whole organisation from the top-down is concerned with tackling important social and economic issues. With this in mind, we worked hard to identify non-food crops that have uses spanning a diverse range of markets, as this would allow The Kindling Trust to explore a wider range of possibilities for future partnerships with the hope of reaching more of these 'green' customers. As outlined in our recommendations section, we have suggested a way to increase market demand for the type of products non-food crops help to produce. Essentially, if more people are buying these products then there is a greater need for certain non-food crops as they are required during manufacturing.

In a 1998 report by The Houses of Parliament [3] we found detailed information regarding the UK's capabilities for non-food crops, but some 14 years later the statistics we found may now be somewhat out-dated (in terms of amount of hectares used to grow specific crops). The report successfully provided information regarding the potential uses of various non-food crops, as well as helping us to categorize crops by end-use (see figure 1.0). We also made use of a publication by the European Commission [4] that outlined the origins of various non-food crops and their uses around the world to double-check these end-uses, and make sure information was in line with what we had previously discovered.

Research Activity & Findings

By utilising these two reports, we were able to meet both of our Determined Outcomes from the Plan of Intention in terms of successfully creating profiles of individual crops, our recommendations of which crops can be found later on in this report. This allowed us to see which crops had the most varied uses, and in turn, which ones we would be recommending to The Kindling Trust.

We are aware that the most applicable markets for non-food crops for The Kindling Trust are those that have end-uses in cosmetics and hygiene industries, construction and clothing, as these are often the most profitable industries. On shelf products often rely on non-food crops as 'ingredients', especially in the cosmetics and hygiene industries, as opposed to being packaged into an on shelf item that is ready to use, non-food crops just help to make up familiar products such as shampoo, conditioner, balms, creams and other products. As the pharmaceutical and cosmetics markets can be sensitive, global supplies of non-food crops are regulated to prevent over-supply and market saturation. This means there is limited potential for production for the global market for The Kindling Trust, which is mainly due to the size of the operation that would be required.

However, there are significant opportunities for on-farm or co-operative extraction, process and manufacture of medium-value products like essential oils and herbal extracts. These can be marketed and sold locally at farmers' markets or through specialist retailers like the ones visited during our primary research (Unicorn, 8th Day). It is important to note that some of these markets are high-value, low-volume which means a small area of land can be quite profitable, but crops need to be grown to meet specific requirements, which in itself may require specialist equipment or careful maintenance of crop growth. Examples of speciality crops include camelina and echium - grown for their oil - or dill, foxglove and chamomile - grown for high-value medicinal or herbal extracts.

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Recommendations

Having reviewed various different sources for information on non-food crops, this section will concentrate on consolidating that material in a concise and informative set of recommendations along with a short supportive summary to each.

Non-food crops highlight a further economical and effective way to generate further revenue from a grower's land. As noted in our research highlighted a dramatic push and incentive for products to be local and ecologically friendly. Therefore, the combination of the monetary incentive there is also this further addition of the consumer market increasing their demand for locally sourced produce.

Food crops allow The Kindling Trust along with their partnered growers, to create and build relationships with local retailers based on a demand for fresh fruit and vegetables. However, non-food crops may require approaching manufacture's rather than directly approaching retailers. Consulting the various sources indicates demand for non-food crops in numerous sectors; biofuels, energy crops, Biopolymers, bio-lubricants, pharmaceuticals and construction. Therefore, there is a wide range of non-food crops that can be grown to fulfil the demand from these sectors.

The first recommendation for The Kindling trust is to create and develop a strong communications strategy promoting and highlighting the importance of non-food crops. This set of communications should set out to inform and encourage the consumer to make ecologically considered purchases. Highlighting the impact these purchases have on the local market as well as the many positive health related issues, it is expected that customers will become more informed regarding non-food crops. This awareness and set of communications can also be extended to local retailers and manufacturers, emphasising the various marketable opportunities available from these crops. This initial recommendation can be helped to be achieved by the accompanied appendices and through exploration of this report. The Kindling Trust already promotes the benefits of eating seasonal food crops for consumers through a project "The Time is Ripe". The project can be seen by visiting the website <http://thetimeisripe.kindling.org.uk/>. Communications such as "The Time is Ripe" are a well presented set of messages that help to inform consumers about food-crops. We recommend that a similar set of messages be introduced centring on non-food crops. Such messages could include health benefits, which non-food crops to look out for within products, the impact of unsustainable ingredients being used, along with the benefits to the local markets. Printed material along with interactive media like the website currently set up for "The Time is Ripe" may be successful examples

Recommendations

of how these communications might take shape. Leaning on previous experience of developing “The Time is Ripe” communications along with information provided within this report will help our client to develop effective communication channels for customers, suppliers and retailers alike.

The **second recommendation** is focused on the actual non-food crops we would encourage The Kindling Trust to promote and explore with the growers they currently partner with. As noted previously and additional table has been provided to compliment this recommendation see appendix **one** . It presents this information in a different format as a reference. Whilst there are a number of non-food crops to draw recommendations from only a select number will be recommended due to various factors such as growing conditions and seasonality. A number of the non-food crops, which we explored, could only be grown over seas outside of Europe therefore eliminates the local aspect and defeating the point of a sustainable production and import process. An example of a non-food crop which is not applicable is tobacco, a widely popular product which is well known for its most common application within cigarettes. Tobacco requires a warmer climate and is typically grown in countries such as China, Cuba, and the U.S. where the weather conditions are suitable. Referring to an earlier point based on the location this crop would have to be grown it would contradict the locality issue.

Borage

Borage, is a plant originating from Syria but now commonly accessible and grown in most regions, Europe included. It has many medicinal uses and has gained traction for its relief of inflammation and menstrual problems. On the shelf products using borage are mainly oil, honey and tea. It is a self-seeding plant, once planted it will grow by itself the next year a massive incentive for local growers as this will minimise the time spent during the next season. Easily grown, although a seasonal plant, it does of course guarantee harvest each year. The advisory is that it is planted between the months of March, April and May with harvest being in the months June to September, the plant therefore taking eight weeks to harvest. The plant is completely edible and has no associated risk if eaten. It has a number of nutritional benefits mainly vitamin C, calcium and iron. For growers it has an additional benefit of being a good companion plant, meaning it complements being grown alongside other plants, of note tomatoes and legumes. Going further, once planted little maintenance is needed due

Recommendations

to its self-seeding nature, and there is also the added possibility of year round harvest. If the correct location is selected, conditions providing space and a mild temperature this plant may continue to grow in the winter months. Due to its accessible nature and the possibility of year round growing borage represents fantastic opportunity to strengthen relationships with non-food partners in the local area. Exploration into new relationships with manufactures of medicinal products or companies which produce tea and oils may also provide opportunities to create trade links.

Hemp

This plant has become notorious during recent years as an illicit source of narcotic drugs (i.e. Cannabis) although the species is actually quite versatile: the stem is used for fibre production; the seed harvests oil, while the narcotic resins are made in glands on the upper leaves and floral areas. Different variations and methods of cultivation are used, depending upon the purpose for which the crop is to be grown; generally commercial cultivation in Europe is confined to fibre production, to which the climate is well suited. Hemp fibre has traditionally been used for sailcloth, cordage, twine, and sacking and for coarser textiles; more recently it has been found to be suitable for pulping for the production of specialist papers and in the re-formation of recycled paper. The seed oil, when obtained, is generally used in the preparation of paints, varnishes and soft soaps. The wide variety of possible uses, and the need to examine alternative sources of supply for materials currently produced from petrochemicals, has resulted in a resurgence of interest in Hemp in Western Europe, and the area it grows in has also increased in recent years. Successful hemp culture requires a deep, well-drained soil and lack of frost during early growth.

Chamomile

Chamomile is a flowering plant in the daisy family. It is native to Europe and Asia. The flowers are used medicinally. Chamomile comes in capsule, liquid, and tea form. Chamomile has a long history of use in Europe for digestive ailments. The active constituents of chamomile have anti-inflammatory properties, and ease spasm and discomfort in the digestive tract. Chamomile contains coumarin, a naturally-occurring compound with anticoagulant or blood-thinning effects. It should not be combined with warfarin or other medications or supplements that have the same effect or be used by people with

Recommendations

bleeding disorders. It shouldn't be used two weeks before or after surgery. Chamomile seeds are one of the few seeds that need light to germinate, so starting them by seed is a delicate process. It is best planted outdoors in August by broadcasting the seed and mixing very lightly with the soil. Alternatively, they can be started indoors in propagation flats in March and transplanted outdoors after a hardening off period. In most cases, direct planting in the garden after all chance of frost has passed are successful, as well. Once they are firmly established, chamomile is extremely hardy.

Crambe

This particular crop has been of interest in the UK since the 1930's, the interest centring on the seed oil, of which 55-60% is in the form of erucic acid. Derivatives of erucic acid are used in slip agents, plasticisers, lubricants and industrial nylons and as fixatives for perfumes, while the excellent heat-transference properties of Crambe oil at high temperatures render it particularly suitable as a lubricant in steel casting. A disadvantage of using Crambe is that the seeds are enclosed in husks, which must be removed before crushing; the protein-rich meal contains glucosinolates and other anti-nutritional substances which reduce its potential rate of inclusion in animal feeds.

The **third and final recommendation** is to locate local manufacturers of pharmaceutical products which local growers could add value to which the recommended crops provided. Using the details provided in the previous recommendation growers can learn the benefits of the crops and begin to parent with companies to begin a supply relationship. This may involve meeting with local growers and educating them on non-food crops. A further extension may also be to reach out to both growers and manufacturers to meet up and discuss how each party can benefit each other. Due to growers being local, this may help with supply issues, being within the locality provides manufactures with a closer link. However having the supplier nearby may not affect the process if the particular crop selected is seasonal.

The above recommendations have been made with The Kindling Trust's objectives and ethos in mind. They have been made with realistic ambitions in mind in relation to The Kindling Trusts current and varied portfolio of projects. During the initial meeting the objectives set out were to create an understanding of non-food crops which this report along with its recommendations achieves.

Conclusions

The non-food crops we have identified in this report are particularly useful to The Kindling Trust when attempting to create links with local growers in Manchester and beyond – having highlighted potential uses of different crops (hemp, chamomile, borage, and crambe) they can now decide on which of our recommended crops they are most likely to pursue. Our recommendations outline a direction for the future of our client, The Kindling Trust, that we are confident enables them to meet some of the objectives we discussed with them in our various client meetings and will hopefully take them one step closer to their goal of owning their own farm one day.

It became clear to us during our research project that the issues surrounding non-food crops, on a national and even global scale, are of increasing importance especially with the earth's resources becoming more depleted and increasingly scarce year-on-year. For this reason we were interested to study the subject from a personal level as it touches on issues such as sustainable agriculture and renewable energy resources and helped us to learn more about our own environment. In this respect we feel our research project has been both rewarding and educational as prior to this project we had no knowledge of non-food crops or their uses, or The Kindling Trust, their vision or their partners – whereas we now have a clearer understanding of our client and similar social enterprises, and we can promote the good work that they do to our peer group.

As we anticipated in our Plan of Intention, and as was proven, we encountered some difficulties when finding up to date resources in relation to non-food crops. This is perhaps due to our previous inexperience within the industry, and we may have looked in areas that were more informative than others had we known where to look. In reality, we had to rely on sometimes out-dated resources, which, although from credible sources, were still from quite some time ago. Other difficulties we encountered were making sure all group members and our contact at The Kindling Trust were able to meet up successfully on the allotted dates and at the times previously set out due to various work, university and business commitments on both sides. Overall, we feel our relationship with The Kindling Trust has been of benefit to both parties and would not hesitate to help them out in the future if they required other research to be carried out.

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Appendix one

Non-Food Crops Classified By End-Use Market	
Agrochemicals	Spurge, pyrethrum, annual wormwood, caraway, quinoa
Board, composites, building and insulation materials	Hemp, flax, kenaf, cotton, common reed, miscanthus, sunflower
Cordage & sacking	Hemp, kenaf, nettle
Cosmetics and toiletries	OSR, amaranth, caraway, linseed, evening primrose, jojoba, pot marigold, coriander, bugloss
Dyes	Woad, madder, safflower
Energy and fuels	OSR, sunflower, willow, miscanthus, poplar, reeds, spurge, cordgrasses
Industrial raw materials	OSR, sunflower, castor, chicory, crambe, kenaf
Lubricants and waxes	OSR, linseed, spurge, rain daisy, honesty, meadowfoam
Paints, coatings and varnishes	Linseed, pot marigold, rain daisy, stokes aster, hemp
Paper and pulp	Hemp, flax, kenaf, miscanthus
Pharmaceutical products and nutritional supplements	Amaranth, caraway, borage, honesty, hemp, meadowfoam, linseed, evening primrose, mallows, field scabious
Plastics and polymers	Honesty, castor, meadowfoam
Resins & adhesives	Rain daisy, stokes aster
Soaps, detergents, surfactants, solvents and emulsifiers	OSR, coriander, hemp, spurge, cuphea, poppy, gold of pleasure, castor, quinoa
Textiles	Hemp, flax, nettle

Appendix one



Appendix one

BORAGE

Borage, is a plant originating from Syria but now commonly accessible and grown in most regions, Europe included. It has many medicinal uses and has gained traction for its relief of inflammation and menstrual problems. On the shelf products using borage are mainly oil, honey and tea. It is a self-seeding plant, once planted it will grow by itself the next year a massive incentive for local growers as this will minimise the time spent during the next season. Easily grown, although a seasonal plant, it does of course guarantee harvest each year. The advisory is that it is planted between the months of March, April and May with harvest being in the months June to September, the plant therefore taking eight weeks to harvest. The plant is completely edible and has no associated risk if eaten. It has a number of nutritional benefits mainly vitamin C, calcium and iron. For growers it has an additional benefit of being a good companion plant, meaning it complements being grown alongside other plants, of note tomatoes and legumes. Going further, once planted little maintenance is needed due to its self-seeding nature, and there is also the added possibility of year round harvest. If the correct location is selected, conditions providing space and a mild temperature this plant may continue to grow in the winter months. Due to its accessible nature and the possibility of year round growing borage represents fantastic opportunity to strengthen relationships with non-food partners in the local area. Exploration into new relationships with manufacturers of medicinal products or companies which produce tea and oils may also provide opportunities to create trade links.



Appendix one

HEMP



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CHAMOMILE



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CRAMBE



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Overview

The Kindling Trust is a not-for-profit social enterprise with charitable aims, backed up by a team of driven individuals who strongly believe in securing the long-term sustainability of the region's food and non-food crop growing market.

The focus of Kindling is to practise practice and demonstrate sustainable production, living and activism, and to support others working toward an ecological and just society. In a day-to-day context this equates to supporting local social enterprises, establishing new business partnerships between existing rural and urban social enterprises, and working with crop farmers and growers to ensure they receive a fair price for their goods.

After recent success in securing trade for farmers of food crops, Kindling are looking in to non-food crops and their uses, in order to gain a clearer understanding of how non-food crops are utilized. They are eager to learn more about which products rely on non-food crops for their production in order to support growers and strengthen financial resilience by local enterprises.

Project Aims

- I. To provide The Kindling Trust with a clearer, more detailed understanding of non-food crops, as well as highlighting on-shelf products that require non-food crops for their production.
- II. To look at the issue of seasonal non-food crops and difficulties associated with their production in relation to the demands of the retailer (i.e. sales slump out of season).
- III. To provide The Kindling Trust with recommendations, based on our research findings, of the most useful, profitable and reliable non-food crops they may benefit from by focusing on in their work with farmers/growers and retailers alike.

Determined Outcomes

- I. A written portfolio detailing our findings based on our project aims, presented in a professional, succinct format and complimented with relevant charts and tables, so that The Kindling Trust has a reference point for detailed background information on non-food crops.
- II. A complimentary slideshow presentation highlighting key findings and focus points that can be used in future client meetings between The Kindling Trust and members of the supply chain for non-food crops.

Research Methods

The nature of the task handed to us by The Kindling Trust effectively means that we will be undertaking secondary market research in relation to the region’s non-food crop market, as well as utilizing the internet and online forums to gather widespread information on the uses on non-food crops and how/where they are grown.

Our team will also be visiting local social enterprises and land-based charities such as ‘Unicorn’ and ‘8th Day’ with the hope of gathering more up-to-date information in relation to certain products sold in their shops and what role non-food crops play in their production or pricing. We will also look at archives and articles from national newspapers to see if there is any information that directly relates to our research aims.

Schedule

By agreement with The Kindling Trust there will be regular contact (via email or telephone) on a weekly basis. This will be to provide regular project updated. Face-to-face meetings will be made as required.

	24 Oct	31 Oct	7 Nov	14 Nov	21 Nov	28 Nov	5 Dec	12 Dec	19 Dec	26 Dec	2 Jan	9 Jan	16 Jan
Initial Meeting													
2 nd Meeting													
Market Research													
3 rd Meeting													
4 th Meeting													
Client Report													
Client Portfolio													

Costs

There are no real costs to be accounted for in undertaking our research, as much of our findings will be through word-of-mouth (speaking to shop owners), the internet, and publications such as national newspapers that are available free online. The Kindling Trust’s location is also relatively close to our campus and private accommodation and therefore within walking distance – incurring zero costs.

Problems

Problem	Solution
Much of our research is likely to be from secondary sources, which means our team will have to make every effort to ensure the reliability, validity and quality of our sources will allow us to meet our research aims. For example, we may find information that relates directly to non-food crops, but the way we may use this	Our team will make every effort to evaluate secondary resources and their value by assessing their intended audience, considering their purpose, the authority of the organisation behind the information (i.e. government, leading social enterprise), and take in to account how new or old the information is. This will ensure

<p>information is key to our success as the brief explicitly highlights the North West region as the focal point of our research.</p>	<p>we only use information that is both relevant and helpful to The Kindling Trust, and also up to date with current affairs for the subject area.</p>
<p>Other potential problems might include difficulty in acquiring the most up to date market data and statistics as we are not already working within the industry, therefore our team may only be able to access older, out of date and potentially less accurate data.</p>	<p>The team will check all information available to them when checking the validity of a source, its date and relevance.</p>
<p>Less serious problems might include group members or contacts at The Kindling Trust missing an email or correspondence from the other side and having to cancel/rearrange a meeting if it was at short notice.</p>	<p>All parties have agreed to regularly check their email inboxes, so neither party is anticipating communication problems for this reason.</p>