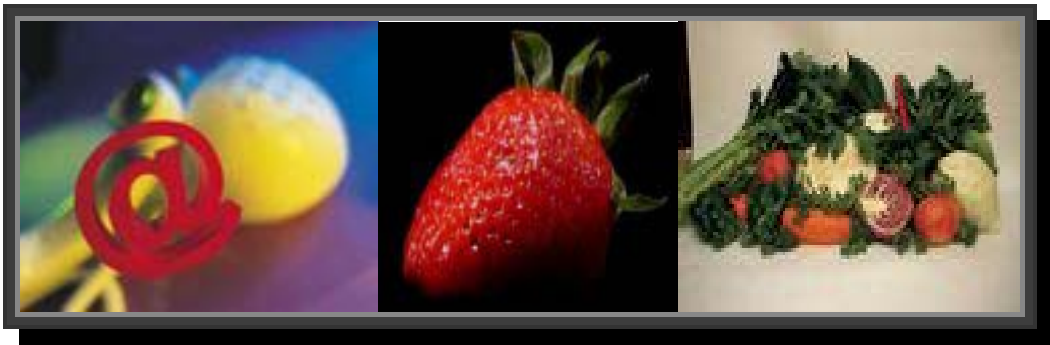


SECTION 1



E-COMMERCE TECHNOLOGIES

Session 1: E-commerce technologies

Key learning points



- The basics of e-commerce technologies
- Websites, corporate presentations and promotions
- Providing market information
- Product trading and auctioning
- Product tracking and traceability
- Remote communications and networks
- Electronic data interchange
- Banking and payments
- Data storage and referencing
- Training on-line

Main objectives of the session

By the end of this session, participants will be better able to:



- Understand the basic e-commerce technologies available for the production and marketing of fresh fruit and vegetables
- Prepare company/farm websites, presentations and promotions
- Search the web for market and supplier information
- Understand the potential of on-line trading
- Implement product tracking and traceability systems
- Develop networks between producers and traders
- Standardise administration systems that would enable electronic data interchange systems to be employed
- Appraise possibilities for the further use of electronic settlements and banking
- Source horticultural information and store data
- Access information on horticultural training on-line
- Design and implement an appropriate e-commerce system and management approach in a company and on a farm

This session also provides an e-commerce framework for the later modules covering the production and marketing of fresh fruit and vegetables.

1.1 The basics of E-commerce technologies

Electronic commerce is a term that has been introduced to cover all the ways in which companies and individuals use computerised systems to do business. New technologies are further facilitating international trade and they enable improved links to be developed between diverse producers, intermediaries and consumers. At the same time they allow improved technical and customer support procedures to be employed through improved logistics, standards and quality assurance. Many have significant consequences for traditional business and trading methods. Potentially electronic technologies can further improve every aspect of horticultural production, sales and purchasing.

There are now more than 100 million regular European Internet users (34% of the European population¹) and more than two thirds of businesses have a website or daily Internet access. Over three quarters of businesses use mobile phones and these enable faster information exchange, dissemination and improved networking. More and more young people are taught not only the use of computers but also the basics of electronic technologies.

Yet while E-commerce clearly offers huge potential benefits to horticultural businesses many have failed due to inexperience, lack of clear value added (over traditional trading approaches) or simply because of under utilisation. The uptake of electronic technologies in horticulture across Europe is comparatively slow when compared to other industrial sectors.

For example in Italy while around 80% of producers know of the existence and potential of E-commerce only 15% are in the process of implementing comprehensive systems, and these are primarily for logistics and relationship development. In Greece the situation is even worse as only 2% of producers have daily access to a personal computer and 0.1% regular access to the Internet. However, if basic guidelines are followed, there are opportunities to further develop practical and profitable commercial operations and Governments as well as companies are increasingly recognising this and now provide a number of on-line support services.

It is important to differentiate between electronic online trading and the use of electronic technologies to facilitate trade. Potentially electronic technologies can help to improve most aspects of a business including production, sales, purchasing and training through making business routines simpler, more productive, cheaper, quicker and more effective.

Simply by accessing a computer, phone line, modem (to connect the two) and an account with an Internet service provider (ISP) or through a laptop computer, that is connected by a PC card to a mobile phone or by digital (WAP) technology on a mobile device, the Internet can be accessed and information sent and received wherever you are and whether the business is large or small. But companies are increasingly understanding that e-business is no longer just about having a website or e-mail but that they can focus on using technology to transform all their business processes. Often at the cost of a local telephone call, the virtual office can also provide numerous other opportunities for improving business performance, efficiency and profitability.

¹ Ranging from 65.2% in Sweden to 11.4% in Greece

1.2 Websites, corporate presentations and promotions

Creating a company website enables customers to browse detailed descriptions of a company, products and prices as well as to place orders 24 hours every day from anywhere in the world. It potentially enables even traditional, specialist and even local suppliers to gain access to much larger potential markets. Nearly 38% of companies with Internet access now utilise it for making purchases or for identifying new suppliers. The Internet is a useful way to find and compare them.

Most serious traders now have their own website and if it is well designed they provide useful global promotional tools and at a price that is often lower than advertising locally on traditional media. Websites also provide an opportunity for improving associations by linking companies together for joint advertising promotions or as member based trade sites. In other cases even countries develop sites to promote particular products or sectors.

Websites enable regular contact with customers. Visual images can be displayed alongside prices lists, special offers, company and new product information. Records can be kept of how many visits the website has and how long each viewer stays. Customer support can be improved by presenting a list of frequently asked questions and answers and by asking people to register for further information. Valuable marketing information is provided on customers that are already interested in your market.

Databases can include background details and transactions of individual customers and can be updated every time the customer calls. Put the database on a network and everybody in a company can provide an informed and helpful response. The whole purchasing process may also be undertaken online with individuals or companies able to order and pay for tailored products.

More than 90% of computers now have compact disc (CD-ROM) and this enables impressive presentations to be tailored to specific customer needs with photographs, sound and video stored and played back from the CD. The unit cost of a CD-ROM can be cheaper than producing a large, glossy catalogue and unlike a paper catalogue publishing in electronic format makes it easier to make future amendments like price changes, half way through the year. CD-ROM based point of information (POI) or point of sale (POS) kiosks are growing in popularity and offer new sales possibilities and can be used as in-store catalogues or guides.

1.3 Providing market information

The Internet provides an ideal starting point and more than two thirds of companies use the Internet for information gathering. Simply by inserting any topic of interest into an Internet search engine such as Yahoo or Google a whole range of papers, presentations and commercial information may be obtained quickly and cheaply.

Most agricultural and food magazines are now online, such as well as business and trade directories, customer surveys, producer, wholesale and retail market prices, trade regulations, events calendars, business reports, specialist data and market analysis.

Through “surfing” the web a mass of accessible, up to date information about markets, potential markets and competitors from throughout the world can be found and much of this is free of charge. The Internet is also an excellent resource for researching new ideas, finding answers to problems and keeping up to date on innovative techniques and products that the business could use. Such research also enables individual customers to be identified and effectively targeted and for invaluable pre-launch trials of new potential products to be carried out.

1.4 Product trading and auctioning

The amount of horticultural trade from on-line auctioning sites is still relatively small when compared to traditional trading channels. The costs of maintaining these systems are of particular concern and experience suggests that such trading platforms still need to establish a stronger credibility with both suppliers and traders. Most sites have to guarantee product quality and delivery from a diverse number of buyers and sellers and many they may not have met. There is also a need to ensure the necessary bank and insurance guarantees against risk of non-delivery according to specification or non-payment for products.

However auctioning is already well established as a traditional marketing tool for many wholesalers and increasingly supermarkets and other buyers are placing their procurement requirements on-line. Auctioning systems are therefore forecast to grow and this growth is likely to be further encouraged by the use of real time transfer of quality pictures across the Internet and mobile phones supported by electronic data interchange, product tracking and traceability as well as online banking and payments. Each of these areas are discussed in more detail below.

1.5 Product tracking and traceability

With around 70% of business costs supply chain related, a tightly integrated, efficient chain can deliver a substantial cost saving. Just in time deliveries can speed up the process without losing quality control and theoretically the Internet should enable trade without requiring lengthy supply chains. Traditionally consumer sales of fruit and vegetables have been made through distributors such as wholesalers, wholesale markets or supermarkets. However with fresh produce the length of the supply chain influences the shelf life of the product i.e. the amount of product lost between the producer and the consumer of saleable quality. The perishability of fresh product varies according to product type and variety but in general rapid and efficient responses and monitoring is required following harvest, particularly for highly perishable products, such as soft fruits of leafy vegetables.

Product tracking is following the movement of a specified product at any time and as it moves between organisations. Use of a digital camera enables real time transfer of pictures and images not easily accessible and without leaving the office. This is a particularly useful development as it enables for tracking and remote inspection of produce, such as at customer delivery points, cargo loading and unloading points, remote monitoring of fruit orchards and trials or to check on fruit destined for winter storage. This provides buyers with accurate and immediate market information on quality and supply.

Product tracing is the ability to identify the origin of a particular product throughout the supply chain and to check its records. Products are normally traced for purposes such as product recall or investigating complaints. Product traceability is becoming particularly important for food products in order to conform to European food safety legislation and to deal with the diversity of international production and supply chain practices. Integrated systems of supply are under development that link producers with traders and supermarkets through crop monitoring, good agricultural practice (GAP), controlled production and detailed record keeping through from production to retail sale.

EAN International (EAN) and the Uniform Code Council (UCC) are developing a set of tools and a standard approach for identifying, tracking and tracing products and so that one label can be used by suppliers, distributors and customers throughout the supply chain. In order to achieve seamless supply chain management it is normal to physically mark goods with identifiers that can be read automatically.

Such systems require links between successive intermediaries and for identification numbers and recording systems to be properly applied. The efficiency of the system will depend upon the reliability of the weakest link in the chain, but once the system is operating all products may be quickly identified using unique and globally recognisable identifiers. Identifiers are assigned by a national numbering organisation and normally a number can only be re-used for another product when at least four years have elapsed since the product was last supplied. Global location numbers can be allocated to companies, accounting departments, warehouse areas, delivery points, transmission points and even individuals if necessary. But it is absolutely vital that suppliers notify their trade customers of the global trade item numbers for the goods they supply.

Most retailers and almost all supermarkets now use electronic point of sale systems (EPOS) to electronically manage both sales and available stock. Bar codes are the standard method of showing product data in a machine readable format. Bar codes are a simple and inexpensive means of enabling automatic data capture because they can be included in the packaging design. Bar coding links producers and traders and enable electronic data interchange and so cut down on wrong deliveries. They help to streamline stock processing, they enable savings in inventory management and improve cash flow. Such data transfer standards for electronic documents support the transactions between supplier and customer and also assist in achieving just in time supply and product traceability.

Each bar code has a unique code number for each different product, type, supplier, colour, size, packaging etc. The bar code consists of a rectangle comprising a series of light and dark parallel bars that can be read by a scanner. It is normally incorporated as part of the original packaging design and it is sometimes printed onto labels. Usually the package can be printed in the normal way but the bar code must be included in the design from the outset. The original bar code can be obtained either via a film master supplier, or using a computer based integrated artwork package. As scanning becomes increasingly automated, at point of sale, in warehouses, in distribution centres, etc., it is very important for the position of bar codes, particularly on traded and transport units to follow strict rules. Each symbol has to be printed with sufficient clear space around it for the scanner to recognise it as a bar code.

Bar codes also enable companies to track transport units through the supply chain by identifying each container or pallet with a unique serial shipping container code (SSCC) and these are used for both non-standard and standard combinations of products.

An innovation under development is the reduced space barcode (RSS). A normal barcode is normally too big to go on individual pieces of fruit. RSS is small enough to identify pieces individually but contains the same information as a normal barcode. The Produce Electronic Identification Board (PEIB) is the international standard for stickers placed on individual pieces of fruit to identify the fruits source and variety as well as its price.

An equally new innovation for fruit and vegetable for tracing and tracking is radio frequency identification (RFID) and its use is likely to increase as costs fall. RFID is a technology capable of forcing major changes to make to the way in which supply chains are managed and has excellent potential for reducing theft and illegal trade. Tamper proof, re-usable and small electronic tags are attached to produce packaging or pallets and these enable even larger amounts of data to be stored compared to standard bar coding. Information can be read at a distance using RFID. You do not have to be able to see a tag in order to read it. The tag must merely pass through an electromagnetic field emitted by the reader and thus can be read at hundreds of metres distance and more than 250 tags can be read in less than three seconds.

EAN-UCC are also developing RFID standards that will enable tags to be applied to goods at source by the manufacturer and for those tags to be readable in any country, any industrial sector and for any application. They will also allow RFID tags and bar codes to co-exist entirely compatibly.

1.6 Remote communications and networks

A network is a set of computers joined together and so enabling them to communicate with each other and so share data files, printers or any other associated equipment and software packages either through a local area network (LAN) within the same building or through a wide area network (WAN) linking computers at different sites. A network allows customer information to be managed in new ways. It can be shared, updated and accessed on a continual basis, and it is ideal for keeping up to date contact lists and diaries and for developing efficient ways of team working.

Through file transfer every aspect of a process can be rapidly communicated to everyone involved in preparing a document and wherever they are in the world and assessed or updated as required. Different types of information prepared by different people can be integrated into a single document.

Mobile communications enable individual companies and markets to keep in constant touch with its sales and buying teams and for travel time to be utilised effectively. By tapping into a market information network a salesperson, buyer or grower can find out information on stock availability, product information, prices or delivery times. Company or product demonstrations can also be made at a distance through video and data conferencing using ISDN lines and without any of the associated travel costs or time away from the office of farm.

Producers and buyers can plan production and demand and jointly improve scheduling to reduce harvest to consumer delivery times and post harvest losses. Technical advice

and information on growing and climatic conditions and harvest maturity may be exchanged between producers, traders or advisers through short messaging services (SMS) on mobile telephones and in tractor and to obtain information on areas such as, market prices, technologies or spraying programmes. This is likely to be further advanced through the use of visual images that can be transmitted through the use of new broadband and WAP 3 technologies. This would allow fruit or vegetables to be viewed remotely at any stage during production and distribution. Over the next 3 years there is likely to be a 10-fold increase in mobile network transmission rates.

On-line chat sites between traders and producers are still largely under developed but potentially MSN, Yahoo or similar messenger services could be used for the exchange of ideas and innovations between both individuals and groups operating regionally, nationally or internationally.

Already discussion groups and video conferencing allow information exchange and problem solving between individuals and companies and they are also useful for developing new ideas, approaches and in transferring technologies within a company and externally with customers.

Digital television may also soon enable producers and buyers access interactive services. The number of channels available in individual countries may well exceed 200 and allow niche markets and particular sectors to be targeted.

1.7 Electronic data interchange

Exchanging trading information on paper (orders, delivery notices, invoices, remittance advice, statements etc.) often involves the re-keying of data. This results in errors and delays and pushes up costs. Processing and dispatching customer orders and payments through electronic data interchange (EDI) and using standard computerised forms enables more efficient trade transactions and lessens the paperwork. EDI is concerned with automatic communications between companies' computers and with the minimum of human involvement.

The exchange of standardised business documents, such as orders and invoices between computers run by trading partners allows purchasers and suppliers to handle transactions more efficiently. This offers opportunities for closer trading partnerships to be developed and increases customer satisfaction. But implementation also requires an ongoing management commitment from both sides.

Once EDI is in place it considerably simplifies the paperwork that is required for shipping, dispatch and money transfer. Instead of printing out documents such as orders and invoices from a computer based system and sending them by post to be read manually and re-keyed into another computer system, documents are sent electronically from one computer to another (usually via a network). The data is not re-keyed, but is integrated directly into the receiver's system. This means that no one introduces mistakes by re-keying the data and documents can be dealt with automatically as soon as they arrive.

EDI reduces charges, risks, processing mistakes or delays in currency exchange and frees staff from time consuming processes such as chasing invoice payments or reconciling orders with payments. EDI also gives companies an opportunity to review current business practices, and identify ineffective or inefficient processes. Stock

holdings are ultimately reduced and are better managed within user companies. Information about present and forecast business activities is shared and companies are better able to respond efficiently to changing customer demands and expectations.

Although, initially at least, it does take time and money to build trust between the trading partners and agree joint business processes, EDI does give a supplier a competitive advantage when dealing with large customers through offering a value added service and also assists in creating favoured supplier status. Customers are likely to place more frequent orders and this is important because to be cost effective EDI requires large volumes of transactions to cover the initial investment time required in setting up the system.

To implement EDI successfully you need to be aware of the systems and processes which your trading partners are operating and where you are going to trade i.e. globally or nationally. You will need to select a standard that will enable you to communicate with your trading partners and should consider setting this out as a trading partner agreement. EDI associations are still under development and will have significant implications for many suppliers. If you are trading or are intending to trade in Europe or globally then the standard is EANCOM. But it is very important to consult your trading partners before making any irrevocable decisions.

Similarly you will have to ensure you conform to the required country legislation particularly in relation to maintaining proper records of online trade and invoicing online and to ensure conformity with relevant taxation and customs requirements.

1.8 Banking and payments

Electronic settlements between producers and traders are becoming increasingly important in replacing the physical transfer of cash and provide an alternative to post dated cheques. Electronic banking enables transactions 24 hours per day and unlike cheques or other paper-based transactions payments that are made electronically clear immediately or at a date agreed between buyer and seller. Banks and other payment service organisations are in the process of developing a practical high level framework which incorporates a wide variety of payments systems, such as SET, E-Check or the Joint Electronic Payment Initiative (JEPI), and these support essential ancillary services such as authentication, receipts, refunds, delivery information and problem resolution but most have already developed their own secure networks.

Credit cards. Most companies collecting payment over the web accept payments using credit cards. In this case it is important to ensure that the communication is encrypted to ensure that third parties cannot obtain the details. The encryption process used is normally the secure sockets layer (SSL). Card vendors are promoting a more secure method known as SET but it is complex, slow and expensive and is not currently widely used.

Most electronic shopping software products will provide a way to collect credit card information securely online. The more sophisticated products will perform online credit checking and authorisation, avoiding the need for a separate phone call to the credit card company to authorise payment. If input forms conform to the ECML standard then the user browser can fill the forms automatically using software.

Different companies have different charging methods such as minimum charge per transaction, minimum monthly payments, % of value of transaction etc. Depending on the merchants type of business some services may be much more expensive than others. These companies typically provide a fully integrated link into shopping software. The effect is that when the moment comes to enter the credit card information then the customer is switched to another site where the payment process is completed; they are then switched back to the merchants site.

One problem for start-ups is that credit card companies require evidence of satisfactory operation over about one year before they will handle transactions. One way around this is to work through another company who handles the credit card process. These companies charge a higher percentage and may also not release funds for some weeks after the transaction is completed to avoid risk of fraud.

Digital cash There are many schemes for implementing digital cash however none of them has yet achieved a significant market share. They can be split into hardware based systems typically using smart cards and software based systems linked to computer systems. Digital cash systems are typically aimed at handling payments that are too small to be handled economically by credit cards.

1.9 Data storage and referencing

Graphical information systems (GIS), digital mapping and positioning technology will become more affordable and available. This will lead to static and dynamic graphical representations becoming a common way of visualising and manipulating administrative and statistical information. Precision farming techniques should become more widespread amongst growers through use of positional information, remote soil analysis and crop inspection.

A single CD-ROM can store huge amounts of data, (more than 300,000 pages of text or more than one hour of video or audio footage). It is an ideal and secure way of archiving data and storage space is massively reduced. Furthermore newly developed DVD technology has an additional capacity to store more than 28 times more information. A scanner can easily convert paper documents like incoming mail into an electronic image. Keeping paper records on CD-ROM not only achieves savings in storage space but also makes it easier and faster to obtain information. Photographs and text can be stored electronically then managed, handled, accessed and shared with speed and flexibility. CD-ROMs are easy to make and replicate and recorders are now cheap enough for even the smallest company to consider creating their own discs.

CD ROM enables better internal communications in areas such as; publishing of financial and annual reports, corporate procedures or training packages and improved customer service through better access to product materials, databases or improved business presentations.

Electronically storing and disseminating information provides huge opportunities for the development of horticultural databases and reference materials including text and digitised photographs, in areas such as the varieties of fruit and available, ongoing and completed research programmes and trial results or digitised field maps.

1.10 Training on-line

The seasonal time demands on growers and the remote location of many makes classroom training and further education difficult to deliver effectively. Provision of on-farm distance learning over the internet provides new options for disseminating educational content and delivering it effectively.

There is significant possibilities for further development of electronic training packages for the horticultural sector in areas such as; production (input applications, cultivation techniques), harvesting (picking procedures, field handling), post harvest technologies, (transport, storage, grading, packing,) and marketing (food safety, quality assurance, branding). Many are already developed but not effectively networked or communicated either between businesses or between training organisations.

Training can prove expensive if the course fees, hotel and travel costs are added to the time away from the office. Furthermore most people absorb information a little at a time. A series of short discussions and interactive meetings are often more productive than tiring non-stop two day courses. Video and data conferencing resolves many of these problems and applying technology to training can make it more targeted, convenient, flexible and affordable.

By storing a training package on a company network staff can train at their own convenience and interactive CD ROMs allow training to be steered to suit individual needs and are often more stimulating. Hundreds of tailor made technical and professional courses are now available for sale and use in house or as distance learning packages that allow participants to interact with a trainer.

POINTS TO REMEMBER

Basic business principles still have to be followed if E-commerce is to be implemented effectively. E-commerce is only a tool to support effective business management and not a replacement for it. This means producers still need to follow good agricultural practices, products have to be harvested, stored, handled and transported effectively, customers will have to be identified and proper procedures for quality assurance employed. Growers and traders will still need to ensure proper finance is available. This manual focuses not only on implementing e-commerce system but also assist trainers and advisers to focus on key issues related to all aspects of fresh fruit and vegetable production and marketing.

It is important to understand your potential and on-line customers and conduct proper research before implementing potentially expensive or innovative technologies. Try the trading and on-line packages of other companies and see what you think. What do you like or not like? How can you do it better?

You should consider picking a team leader for e-commerce development or else consider working alongside a reputable and trustworthy adviser that is knowledgeable not only of the strengths of e-commerce but also its limitations. Effective advice should also be

adapted for the specific business needs of the farm or company and will need to be supported by training.

Design of an e-commerce system within a company or farm, however large or small, should be focused on a clear and specific objective that will improve business practices, increase sales or reduce costs and so overall profitability. E-commerce technology should not be simply adopted just because it is innovative. Costs will vary considerably and so the initial design should be well planned and thought through.

Even during the design of a website we might ask: What elements will be included? How will it be hosted? Will it be possible to update it and how will you do that? Is it fast to download and can it be browsed easily? Should it be interactive with customers or suppliers? How will staff be trained in its use? Should it be multi-lingual? Should you have links to other traders or websites? If you allow other users to update your site you may also have to include disclaimer in order to prevent you from future legal action. The domain name also will have to be registered. How do you want to do this? The name will not just be a website address but also a point of contact for your farm or company.

If we are designing an online trading we might have to ask additional questions such as: what laws, taxes and currency transfer problems might you have? What will be your policy on refunds or returns of products? How will you turn occasional browsers of your site into real customers? How will you build trust amongst your customers that on-line trading is secure? How will you show your products and services? What payment options will be available and will credit card facilities be available? How will you confirm payments and deliveries? What trading standards will you use? You will also need to consider having an SSL certificate, on-line trading agreements and contracts as well as ensuring anti-virus software.

But e-commerce need not be beyond the realm of even the smallest company or farm if the implications and objectives are clearly understood and activities are planned. Most countries will have agencies, colleges or companies available to provide (often free) advice on e-commerce applications and much additional information can be downloaded. See the websites section at the end of this manual.

CASE STUDY

Rubicon Computer Systems

Businesses that have for years supplied the fresh produce industry with computer systems are increasingly beginning to introduce the benefits of e-commerce to their customers. At the beginning of 2002 Rubicon Computer Systems launched a new application “mailDesk”. The aim of this system is to assist in transferring large amounts of data between growers, shippers, importers, stores and hauliers.

For example, sending a shipping manifest from an export to an import company will normally require a lot of data to be supplied about the growers, product pallets, barcodes and so on. Traditionally this information is sent by fax and inputted into a computer by the import organisation. This is both time consuming and is not cost effective

The “mailDesk” system enables data in a standard format to be exchanged between trading partners over the Internet. Using a standard format and e-mails to exchange the

data gives a dramatic reduction in administration and paperwork, it reduces errors and duplication of effort.

Rubicon's other innovation includes "Trading Desk" is an advanced sales order management system that enables daily sales information and order details to be exchanged over the Internet and allows growers and traders to print delivery notes and return despatch and traceability information for automatic invoicing and stock updates. The system gives secure worldwide access to any authorised user with a PC and Internet connection.

E-COMMERCE EXERCISES

Look at your competitors websites or those of similar companies. How does it look? How easy is it to browse? What elements do you like or dislike? What lessons can you learn for your own site?

Identify an issue of importance to your farm or company. By browsing the web find as much information about that issue as you can. At the same time make a note of all the websites that are relevant to the production and marketing of fresh fruit and vegetables.

Identify a company or organisation using, or piloting, any of the systems outlined above. Find out more information about the strengths and weaknesses of these systems and write a case study.

Get information on all international standards for the trading of fresh fruit and vegetables and e-commerce. Identify your national institutions that set standards in these areas and get copies of these standards.

Which databases, relevant to horticulture production and marketing, are available on-line in your own country or internationally? Undertake a web search to find out.

What training packages, case studies or background materials are available from your own country on e-commerce? How can you get copies?

Which training and advisory organisations in your own country are able to provide support to e-commerce in horticulture? Make a list of their names, addresses and activities.