

6<sup>TH</sup> NATIONAL SMALL FARM CONFERENCE PROCEEDINGS  
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Presentations included here:

- I. **Keeping it Safe: Good Agricultural Practices and Good Handling Practices** -Richard Molinar, UC-Davis, [rhmolinar@ucanr.edu](mailto:rhmolinar@ucanr.edu); Elizabeth Bihn, Cornell University, [Eab38@cornell.edu](mailto:Eab38@cornell.edu)
  - a. Presentation slides
  - b. Best practices information
  - c. Food Safety GAP resources list
  
- II. **New and Emerging Technologies for Enhancing Small Farm Profitability**-Robin G. Brumfield, Rutgers, The State University of New Jersey, [Brumfield@aesop.rutgers.edu](mailto:Brumfield@aesop.rutgers.edu) and Theresa J. Nartea ,Virginia State University/Cooperative Extension, [tnartea@vsu.edu](mailto:tnartea@vsu.edu)
  
- III. **Key Concepts for Developing a Business Plan**  
Mr. Wendell H. Pepper, Center for Profitable Agriculture  
University of Tennessee Extension  
[wpepper@utk.edu](mailto:wpepper@utk.edu)

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**Keeping it Safe: Good Agricultural Practices and Good Handling Practices**

Richard Molinar, UC-Davis,  
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Elizabeth Bihn, Cornell University  
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**Keeping it Safe – GAPs**

**'Manuals and Audits'**

**6<sup>th</sup> National Small Farm Conference**

**Richard H. Molinar, Farm Advisor**

**September 18, 2012**

HEALTHY FOOD SYSTEMS

University of California  
Agriculture and Natural Resources

**Cooperative Extension**



*Making a Difference  
for California*

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**UCCE  
Small Farm  
Produce Food Safety  
Team**



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# How much should I do?

1. Use common sense — the good old days
2. Make a written food safety plan for your farm
3. Do a self-audit (Self-Certification)
4. Become certified by a 3<sup>rd</sup>-party





# 1. The Good Old Days “common sense”



Grandfather's Farm



The Man Behind the Plow



The Jack Benny Show, originally broadcast Jan. 11, 1953



1982 The Commodore 64 computer introduced,

64 kB RAM + 20 kB ROM

1989 Berlin Wall came down

## 2. GAPs Manuals

Many templates available

<http://onfarmfoodsafety.org>

[http://ucanr.org/sites/Small\\_Farms\\_and\\_Specialty\\_Crop/](http://ucanr.org/sites/Small_Farms_and_Specialty_Crop/)

Univ California

[http://cms.oregon.gov/ODA/ADMD/Pages/gap\\_ghp.aspx](http://cms.oregon.gov/ODA/ADMD/Pages/gap_ghp.aspx)

Oregon Dept Agriculture

<http://www.uvm.edu/~susagctr/gapresources.html>

Univ Vermont

<http://intranet.primuslabs.com/igap/default.asp>

Primus Labs

Use the templates, don't start from scratch.

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**Some buyers still don't require anything  
for LOCAL sales.....BUT... times are changing**



## 3. Self- Audit



**8 hrs – 2 days**



**2-3 hours**

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~ Self-Audit ~

Still accepted by some BIG buyers



**A checklist, signed by the Farmer  
possibly include water test, worker training**

Check boxes

**2. Traceability:** Each container leaving the farm has our name, address, crop, and quantity.....

**3. Health and Hygiene- for employees and visitors .** All employees are trained in and must follow good hygiene practices. ....

- *Self-Certification:*
- I certify that, at *XXX FRESH PRODUCE*, we comply with all of the Good Agricultural Practices (GAPs) checked off in this document; I review this material annually with my employees; and I have records of worker training.

\_\_\_\_\_  
Signed

\_\_\_\_\_  
date

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## Self Certification

## Farm Safety Manual

[change, delete, or fill-in parts in yellow highlight, remove highlights]

### Good Agricultural Practices (GAPs) Manual

FARM SAFETY MANUAL: **ABC FARMS**

#### STANDARD OPERATING PROCEDURES (SOP's)

Checked boxes indicate I have read documentation to support this

#### Table of Contents

General Farm Description	2
Traceability	2
Worker Health and Hygiene	3
Illness and accident procedures	3
General sanitation	3
Chemicals and Pesticides	4
<b>Farm Review</b>	
Water Assessment	4
Wildlife and Livestock	5
Manure and Biosolids	6
Land assessment and soil	6
<b>Field Harvest and Packing</b>	
Worker sanitation	7
Equipment	7
Transportation	7
Forms	
Map	9+
Training	
Visitor sign in	

## 4. 3<sup>rd</sup> Party Audit



## Companies and Agencies that will do 3<sup>rd</sup> Party Audits

- *US Dept of Agriculture – contacts for various states*
- *California Department of Food and Agriculture - Inspection and Compliance*
- *AIB International*
- *NFS Davis Fresh Technologies*
- *Primus Labs*
- *Scientific Certification Systems*
- *Silliker*
- *Global GAP*
- *ISO International Standards Org*

*\*This list is not all-inclusive*

## Industry Food Safety Requirements

- Many buyers require a 3<sup>rd</sup> party food safety certification (CDFA-USDA, Primus Labs, NSF Agriculture)
- Cancelled policies or increased premiums for some farms that direct-market leafy greens



## Kinds of Audits

- GFSI – Global Food Safety Initiative

Cert ID            BRC (British Retail Consortium)  
                         SQF (Safe Quality Foods)

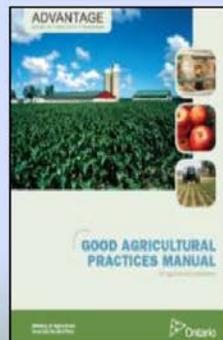
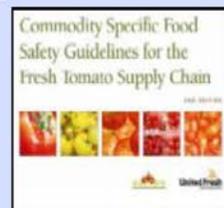
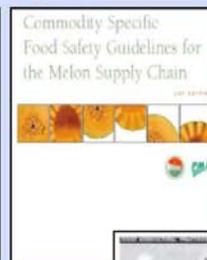
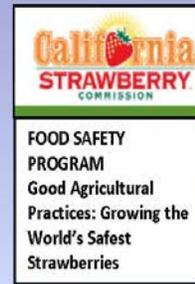
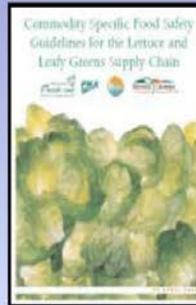
GlobalG.A.P. (formerly Euro Gap)  
100 different certification bodies= NSF,  
Primus, SAI, SCS

- Harmonized Audit            (is not necessarily global)

- GAP – GHP Audit            (is not necessarily global)

# Commodity-Specific GAPs and Food Safety Audit Checklists

- Melon
- Tomato
- Stone fruit
- Mushroom
- Lettuce & Leafy Greens
- Culinary Herbs
- Green Onions
- Sprouts
- Almond
- Citrus
- Strawberry
- Watermelon
- Blueberries
- Asparagus





# **USDA Good Agricultural Practices Good Handling Practices**

## **Audit Verification Checklist**

**General Questions** (All audits begin with and pass this portion)

**Part 1 – Farm Review**

**Part 2 - Field Harvest and Field Packing Activities**

**Part 3 - House Packing Facility**

**Part 4 – Storage and Transportation**

**Part 6 – Wholesale Distribution Center/Warehouse**

**Part 7 – Preventive Food Defense Procedures**

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## Audit Results

### USDA-AMS website for audits

<http://www.ams.usda.gov/AMSv1.0/ams.fetchTemplateData.do?template=TemplateN&page=GAPGHPAuditVerificationProgram>

S & H Farms	P. O. Box 650	Gonzales, CA	Tomato Food Safety Protocol Audit	Open Field Production, Harvest, and Field Packing	August 24, 2012	Tomatoes
Sam's Farm	1624 E. Knight Ct.	Visalia, CA	USDA Good Agricultural Practices & Good Handling Practices Audit	Farm Review	August 31, 2012	Beans, Cantaloups, Corn, Cucumbers, Eggplant, Peppers, Pumpkins, Squash, Strawberries, Tomatoes, Watermelons
Samuel Alvarez Farm Labor/ Paramount Citrus	P. O. Box 3246	Ventura, CA	USDA Good Agricultural Practices & Good Handling Practices Audit	Farm Review, Field Harvesting and Field Packing Activities	March 2, 2012	Lemons



<http://www.primuslabs.com/psr/platino.aspx#>

[Sunnyside Packing Company](#)



## Parts to a GAPs Manual

### Farm Review

- Traceability
- Risk Assessment
- Worker Health, Hygiene
- Water Usage
- Sewage
- Animals
- Manure
- Soils
- Record Keeping, logs, map
- + farm walkabout

### Field Harvest, Packing

- Field Sanitation & Hygiene
- Field Harvesting, Transportation

+ unannounced visits

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## *Sam's Farm*

559-799-6934 (Pao)  
1624 E. Knight Ct  
Visalia, CA 93292

## Good Agricultural Practices (GAPs)

<b>Table of Contents</b>	<b>pg</b>
<b><u>General Conditions</u></b>	-
Farm Description	2
Traceability	2
Worker Health and Hygiene	2
Illness and accident procedures	3
General sanitation	3
Chemicals and Pesticides	4
<b><u>Farm Review</u></b>	-
Water Assessment	4
Wildlife and Livestock	5
Manure and Biosolids	5
Land assessment and soil	5
<b><u>Field Harvest and Packing</u></b>	-
Worker sanitation	6
Equipment	6
Transportation	7

## Possible Future Requirements

- Schools
- Farmers Markets
- Donations to Food Banks
- Roadside stands, CSA's

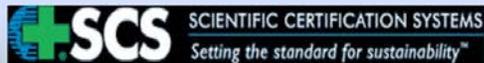


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## Where we are now...

These audit organizations, and others, are using or plan to use the Harmonized Standards for GAP audits.

**GLOBALG.A.P.** North America



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USDA Good Agricultural Practices Good Handling Practices  
Audit Verification Checklist



This program is intended to assess a participant's efforts to minimize the risk of contamination of fresh fruits, vegetables, nuts and miscellaneous commodities by microbial pathogens based on the U.S. Food and Drug Administration's "Guide to Minimize Microbial Food Safety Hazards for Fresh Fruits and Vegetables," and generally recognized good agricultural practices.

Firm Name: \_\_\_\_\_  
Contact Person: \_\_\_\_\_  
Audit Site(s): \_\_\_\_\_  
Main Address: \_\_\_\_\_  
City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_  
Telephone No: \_\_\_\_\_ Fax: \_\_\_\_\_  
E-mail: \_\_\_\_\_  
Auditor (s): (list all auditors with the lead listed first) \_\_\_\_\_

USDA or Fed-State Office performing audit:  
Arrival Date: \_\_\_\_\_ Time: \_\_\_\_\_  
Departure Date: \_\_\_\_\_ Time: \_\_\_\_\_  
Travel Time \_\_\_\_\_ Code \_\_\_\_\_  
Person(s) Interviewed (use back of sheet if necessary to list all) \_\_\_\_\_

**\$92.00 per hour**  
**Be organized – receipts,**  
**records, documents**

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Did the auditee participate in GAP & GHP training?

Yes  No

Is there a map that accurately represents the farm operations?

Yes  No  N/A

Legal Description/GPS/Lat.-Long. of Location: \_\_\_\_\_

Are all crop production areas located on this audit site?

Yes  No  N/A

Total acres farmed (Owned, leased/rented, contracted, consigned): \_\_\_\_\_

Does the company have more than one packing facility?

Yes  No  N/A

Is there a floor plan of the packing house facility(s) indicating flow of product, storage areas, cull areas, employee break rooms, restrooms, offices?

Yes  No  N/A

Is any product commingled prior to packing?

Yes  No

**Part 1 farm review=usual  
Sometimes part 2  
depending on buyer**

Audit Scope: (Please check all scopes audited)

General Questions (All audits must begin with and pass this)

- Part 1 – Farm Review.....
- Part 2 - Field Harvest and Field Packing Activities.....
- Part 3 - House Packing Facility.....
- Part 4 – Storage and Transportation.....
- Part 5 – (Not Used).....
- Part 6 – Wholesale Distribution Center/Terminal Warehouse.....
- Part 7 – Preventive Food Defense Procedures.....



Products: \_\_\_\_\_

Auditors' Signature(s): \_\_\_\_\_

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General Questions

Implementation of a Food Safety Program

Questions	Points	Yes	NO	N/A	Doc
P-1 A documented food safety program that incorporates GAP and/or GHP has been implemented.					D
P-2 The operation has designated someone to be an established food					D

They want to see a document

Traceability= 1 up, 1 back  
 For farmer = buyer

Traceability

Questions	Points	Yes	NO	N/A	Doc
A documented traceability program has been established.	15				D
G-2 The operation has performed a "mock recall" that was proven to be effective.	10				R

Worker Health & Hygiene

Name  
 Address  
 Field (lot)  
 Date hyst  
 Crop  
 Quantity

Questions	Points	Yes	NO	N/A	Doc
G-3 Potable water is available to all workers.	10				R
G-4 All employees and all visitors to the location are required to follow proper sanitation and hygiene practices.	10				P
G-5 Training on proper sanitation and hygiene practices is provided to all staff.	15				D
G-6 Employees and visitors are following good hygiene/sanitation practices.	15				
G-7 Employees who handle or package produce are washing their hands before beginning or returning to work.	15				
G-8 Readily understandable signs are posted to instruct employees to wash their hands before beginning or returning to work.					
G-9 All toilet/restroom/field sanitation facilities are clean. They are properly supplied with use towels, toilet paper, hand soap or antibacterial soap, and potable water for hand washing.					
G-10 All toilet/restroom/field sanitation facilities are serviced and cleaned on a scheduled basis.					R

They want to see a 'Record', a "Document"  
 Have receipts for bottled water  
 Have training records





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**Water is one of the most difficult to decide and discuss. You set the limit and that is what the auditor goes by – but it has to be reasonable  
See handout**

**Part 1 - Farm Review**

**Water Usage**

(1-1) What is the source of irrigation water? (Pond, Stream, Well, Municipal, Other)  
Please specify:

---

(1-2) How are crops irrigated? (Flood, Drip, Sprinkler, Other) Please specify:

---

Questions	Points	Yes	NO	N/A	Doc
1-3 A water quality assessment has been performed to determine the quality of water used for irrigation purpose on the crop(s) being applied.	15				D
1-4 A water quality assessment has been performed to determine the quality of water use for chemical application or fertigation method.	15				D
1-5 If necessary, steps are taken to protect irrigation water from potential direct and non-point source contamination.	15				

**Sewage Treatment**

Questions	Points	Yes	NO	N/A	Doc
1-6 The farm sewage treatment system/septic system is functioning properly and there is no evidence of leaking or runoff.	15				
1-7 There is no municipal/commercial sewage treatment facility or waste material landfill adjacent to the farm.	10				

**Animals/Wildlife/Livestock**

Questions	Points	Yes	NO	N/A	Doc
1-8 Crop production areas are not located near or adjacent to dairy, livestock, or fowl production facilities unless adequate barriers exist.	15				
1-9 Manure lagoons located near or adjacent to crop production areas are maintained to prevent leaking/overflowing, or measures have been taken to stop runoff from contaminating the crop production areas.	10				

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University of CA Coop Est #2652/50  
 Project. Sam's Farm



California ELAP Certificate #1371

Laboratory Work Order #: 2G27024

2527 Fresno Street  
 Fresno, CA 93721  
 (559) 268-7021 Phone  
 (559) 268-0740 Fax

Dellavalle Laboratories 1910 West McKinley #110 Fresno CA, 93728	Project: 2012 Analytical Services	Report Date:
	Project Number: Sam's Farm	07/31/2012
	Project Manager: Elisa Sanchez	

**Analytical Report for Microbiologicals**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
---------	--------	-----------------	-------	----------	-------	----------	----------	--------

176164-1 Faucet Near Well Laboratory ID#: 2G27024-01 (Drinking Water)  
 Date Sampled: 7/27/12 12:35 Sampled By: Client Date Received: 7/27/12 16:05

Total Coliforms	<1.0	1.0	MPN/100mL	1	T2G2714	07/27/12	07/28/12	SM9223B
E. Coli	<1.0	1.0	MPN/100mL	1	T2G2714	07/27/12	07/28/12	SM9223B

**\$31.00**

## **Previous Land Use? Write it down**

**What was the land used for previously**  
crop land, fallow? dairy, livestock, poultry farms?

**What did you do to resolve possible problem**  
e.g., had the soil tested for bacteria

**What you did to reduce the risk**  
e.g. dug a trench or put up a berm of soil

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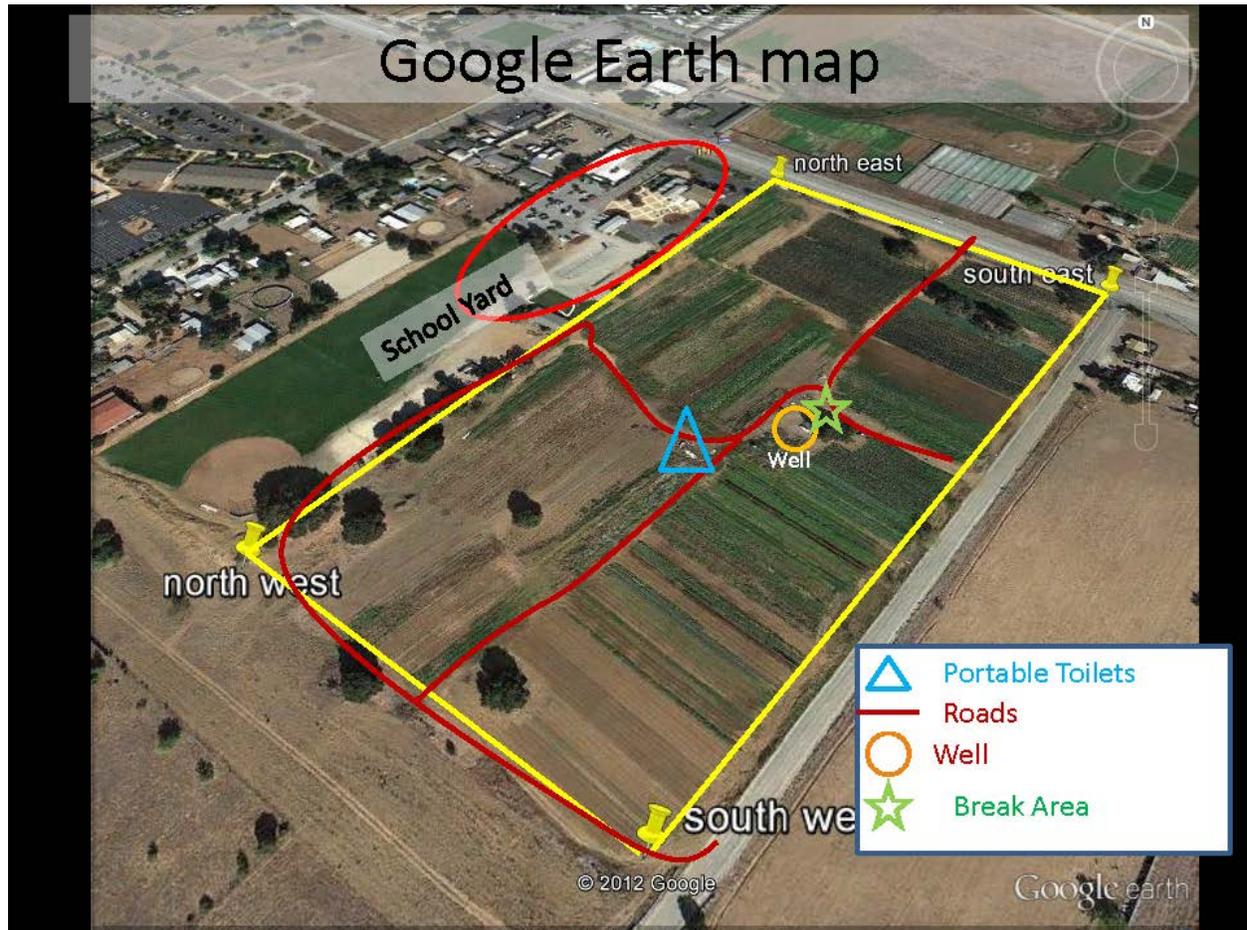
## Map of farm

- Field map:
- **Map should include:**
  - Crops
  - Roads
  - Wells and other water sources
  - Lakes, rivers, ponds, reservoirs
  - Ditches
  - Buildings, including semi-permanent portable toilets and break areas (designated areas)
  - Neighboring property features

## Creating a map...

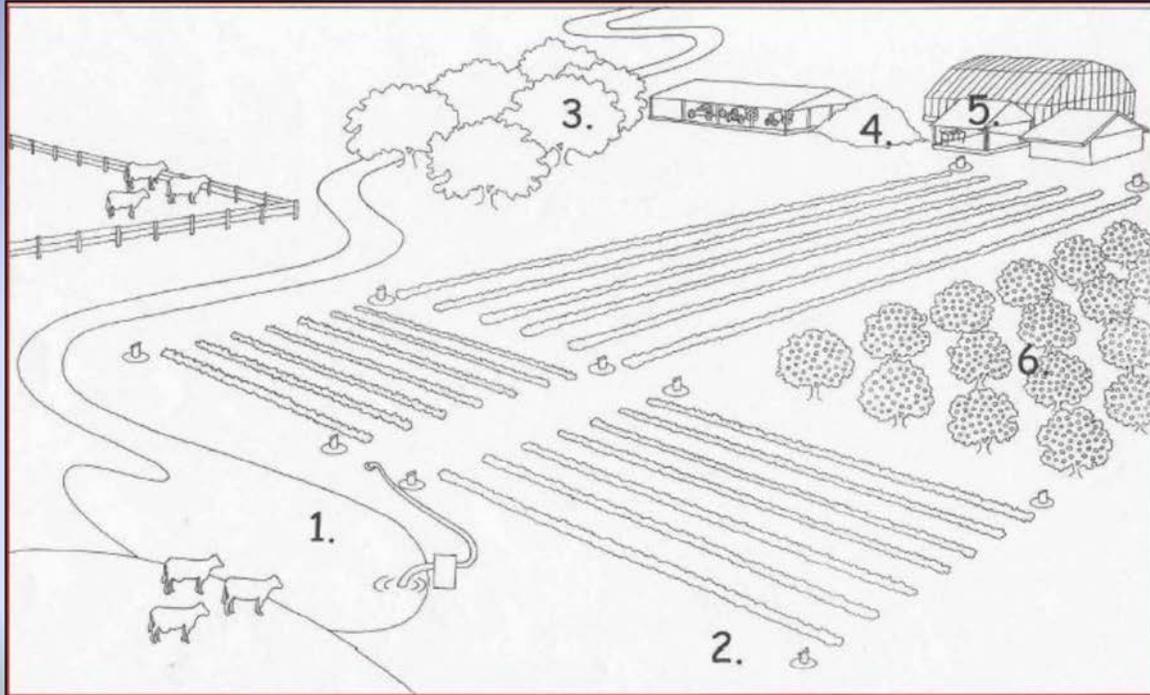
- Hand draw the map
- Download one from the internet (eg, Google maps, or Google earth)
- Contact your NRCS office for a map
- Re-use one previously submitted to Ag Commissioner

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## Another map



Source: U of FL IFAS Extension. ,Small Farm Food Safety, Fresh Produce, Part 4: Farm Map Activity. FCS8845

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**Know source of water**  
**Know what is upstream**  
**Know seasonal variation (does source change?)**



Source: NRCS

## Irrigation Source ?



## Potential Fertilizer Contamination



## Potential Fertilizer Contamination



## How often should I test water?

If water source is:

Closed source – well →

Then testing frequency is:

Annually at beginning of season

canal, pond, river →

Every 3 months during season

Municipal water →

Keep records from district

\* California Strawberry Commission (1998) Quality Assurance Program

## What do water test results mean?

- Fecal coliform and generic E. coli are indicators, not pathogens
- No established standards for bacterial water quality for agricultural irrigation
- See handout and farm safety plan template for more information

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Best Practice Information ..... <http://onfarmfoodsafety.org/>  
Compiled R. Molinar, UC Cooperative Extension Fresno



### WATER MANAGEMENT AND CORRECTIVE/PREVENTIVE ACTIONS

#### Water Quality

- Agricultural water must be sourced from a location in a way that complies with prevailing regulations.
- Agricultural water quality must meet all applicable federal and state laws and meet any additional regulations relating to its intended use.
- A review or new assessment must be conducted any time there is a change made to the system or a situation occurs that could introduce an opportunity for contamination.
- Water quality becomes even more critical for water that comes into direct contact with the edible part of the plant, especially close to harvest.
- It is currently recommended that water used for foliage applications always be from a pathogen free source. If this is not possible, it is strongly recommended that a potable water source be used for foliage applications within 2 weeks of harvest.
- Spray irrigation poses the most risk if water is of questionable quality due to coverage of foliage which may be harvested. Spray or over head irrigation water must be from a good water source that does not contain pathogens above an acceptable level.
- If you are using a water source which may not be potable, drip or trickle irrigation methods may reduce the risk of contamination because the water is less likely to come into direct contact with the edible portion of the product.
- If you suspect chemical contamination of your water source, please consult your local authority and/or EPA for testing requirements.

#### Example corrective actions and preventive measures for your water management plan may include<sup>2</sup>:

- Construct barriers (e.g., fences, ditches, storage pits).
- Control run-off with sod strips, grass waterways, vegetative buffers, etc. Run-off structures, waterways, diversion berms and buffer areas may be able to divert run-off away from surface water sources or a well.
- Level ground to prevent runoff.
- Spread manure during dry weather or incorporate it within 24 hours of spreading.
- The storage or application of noncomposted manure may also contribute to microbial contamination of water source<sup>3</sup>. Leave a manure-free protective strip at least 33ft (10 m) around surface water sources<sup>2</sup>.
- Ensure all equipment is well-maintained (e.g. so there are no fluid leaks).
- Do not clean, maintain or drain farm equipment where the water source may become contaminated.
- Ensure proper operation of sewer/septic system.
- Install aeration or filtration systems.
- Irrigate in the morning to increase rapid drying and reduce pathogen survival with ultra violet/sun light. Allow as long a period as possible between irrigating and harvesting.
- Test water for chemicals if you know of a particular problem (e.g., agricultural chemical spill where you know what chemical was spilled).
- Test water for Generic Escherichia coli (E. coli), E. coli O157-H7, Enterohemorrhagic E. coli (EHEC) and Salmonella spp using an accredited lab. Percolation into shallow ground water or inadequately-protected wells has been shown to be involved in outbreaks of E. coli O157:H7<sup>2</sup>.
- Does not irrigate if you suspect contamination

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- Be sure that well casings extend more than 12 inches above the land surface, and that flood water does not reach the well<sup>3</sup>.
- Observe local rain patterns to determine its effect on run-off from adjacent farms or animal feeding operations to your water source<sup>3</sup>.
- Animal production nearby may pose risks due to the high volume of animal waste or the possibility of animal grazing near the water source. The use of fences or gates may be able to keep animals out.
- Wild animals can pose the same contamination risks as domestic or farm animals. A large wild animal population may also necessitate fences or gates, or selection of an alternate water source during specific periods<sup>3</sup>.

**When test results are obtained there will be certain acceptance criteria which determine if the water is adequate for its intended use. The following are recommended best practice acceptance criteria:**

- E. coli 0157-H7, Enterohemorrhagic E. coli (EHEC) and Salmonella spp results must be negative<sup>22</sup> (0 per 100 mL of water).
- Generic E. coli results must lie between  $\leq 126$ MPN (or CFU)/100mL and  $\leq 235$ MPN/100mL for any single sample where edible portions of the crop ARE contacted by water<sup>22</sup>.
- If testing has been performed for fecal coliforms then the limit is less than 2.2 fecal coliforms/100 mL of water. The Environmental Protection Agency (EPA) established this standard for reclaimed water (treated effluent) used on nonprocessed fresh produce. This 2.2 fecal coliforms/100 mL limit is considered free of pathogens for nonpotable agricultural purposes by the EPA. If higher densities of fecal coliforms are detected, it is suggested that growers do not use overhead irrigation<sup>4</sup>.
- It is recommended that you check your local/state guidelines before interpreting any results. The laboratory who undertook the test, local EPA office and your local Agricultural Extension agent may also be able to help.

Please Note: The above limits outlined are for use for agricultural irrigation water. If you are using your well water source for drinking also then the limits should meet EPA drinking water standards.

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Various water **acceptance criteria for irrigation** (from actual GAPs manuals)

LGMA	< 126 MPN/100ml (geometric mean of 5 samples) AND <576 MPN/100ml (all single samples)
Tomato	The water test meets <u>EPA recreational water standards for E. coli; i.e., 40 CFR Part 131.41(c)</u> (E. coli < 126/100 ml MPN)
Avocado	wells at least once per year, total coliform/generic E coli, Cannot exceed 1000* MPN (or CFU)/100 mL (source: WHO, World Health Organization)
Strawberry	$\leq 126$ MPN or CFU/100 mL <i>E. coli</i> . When multiple samples (at least 5 samples) are taken, no one sample may exceed 235 MPN/100ml. Drinking and hand-wash water <1 MPN or CFU/100 ml of fecal coliforms/ <i>E. coli</i> . <b>WELL DISINFESTATION:</b> If the laboratory analysis shows the water is not free of bacterial contamination (e.g., fecal coliforms <2.2 MPN or CFU/100 ml), the disinfection procedure should be repeated.
Potable	drinking water standards = 40 CFR Part 141.63 Basically fecal coliform/ <i>E. coli</i> free

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### FOOD SAFETY GAPs RESOURCES

#### University of California publications

FREE PUBLICATIONS (note that PDF files require Adobe Acrobat reader)

- Good agricultural practices (GAPs) [http://ucanr.org/uc\\_gaps](http://ucanr.org/uc_gaps)
- Las Publicaciones en Español (in Spanish) [http://ucanr.org/gaps\\_espanol](http://ucanr.org/gaps_espanol)
- Post-harvest chlorination <http://ucfoodsafety.ucdavis.edu/files/26414.pdf>
- Water disinfection for pre-harvest and post-harvest applications <http://anrcatalog.ucdavis.edu/pdf/7256.pdf>
- Post-harvest handling of organic crops <http://ucfoodsafety.ucdavis.edu/files/26413.pdf>

#### USDA Audit Checklist & Commodity Specific GAPs Manuals

- USDA-AMS GAPs Audit Checklist  
LGMA, Tomato, Mushroom manuals <http://www.ams.usda.gov/AMSV1.0/GAPGHP>
- California Strawberry Commission <http://www.calstrawberry.com/members/fsp-guidelines.asp>
- California Avocado Commission <http://www.californiaavocadogrowers.com/cac-gap-forms-and-resources/>

#### GAPs Templates to Create your own

- On-farm Food Safety Project: a user-friendly program to develop your own GAPs: <http://onfarmfoodsafety.org/>
- Penn State food safety plan template: <http://tinyurl.com/d4snf7g>
- University of Vermont <http://www.uvm.edu/~susagctr/gapresources.html>
- UMass Extension templates and forms <http://extension.umass.edu/nutrition/index.php/programs/food-safety/programs/good-agricultural-practices/gap-manual>
- University of Minnesota templates and forms <http://safety.cfans.umn.edu/>
- Oklahoma University logs and worksheets <http://www.okfarmtoschool.com/resources/fts-distro-foodsafetymanual/>
- Rutgers Experiment Station <http://niveg.rutgers.edu/html/mf-food-safety.html>
- Washington Dept of Agriculture <http://agr.wa.gov/Inspection/FVInspection/GAPGHP.aspx>
- Oregon Dept of Agriculture [http://cms.oregon.gov/ODA/ADMD/Pages/gap\\_php.aspx](http://cms.oregon.gov/ODA/ADMD/Pages/gap_php.aspx)
- Cornell University, Produce Safety Alliance <http://producesafetyalliance.cornell.edu/psa-mat.html>  
& <http://www.gaps.cornell.edu/rks.html>
- University of California [http://ucfoodsafety.ucdavis.edu/UC\\_Publications/UC\\_Good\\_Agricultural\\_Practices\\_GAP/](http://ucfoodsafety.ucdavis.edu/UC_Publications/UC_Good_Agricultural_Practices_GAP/)  
& [http://ucanr.org/sites/Small\\_Farms\\_and\\_Specialty\\_Crop/Food\\_Safety\\_on\\_the\\_Farm/](http://ucanr.org/sites/Small_Farms_and_Specialty_Crop/Food_Safety_on_the_Farm/)

#### FDA Guidance documents

Documents from the US Food and Drug Administration which provide guidance on appropriate measures to take to protect produce food safety

<http://www.fda.gov/Food/GuidanceComplianceRegulatoryInformation/GuidanceDocuments/>

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## ■ University of California Agriculture and Natural Resources

To learn more about selected topics:

### Composting

Managing Manure Applications: <http://ucfoodsafety.ucdavis.edu/files/26444.pdf>

Clean Washington Center, On-farm composting manual: <http://www.cwc.org/wood/wd973rpt.pdf>

Cornell guidelines: <http://compost.css.cornell.edu/index.html>

### Water quality

Testing private wells and guide for well owners (CA Water Boards)

[http://www.swrcb.ca.gov/gama/domestic\\_wells\\_testing.shtml](http://www.swrcb.ca.gov/gama/domestic_wells_testing.shtml)

[http://www.waterboards.ca.gov/gama/docs/wellowner\\_guide.pdf](http://www.waterboards.ca.gov/gama/docs/wellowner_guide.pdf)

### Wildlife Control

**Wildlife Pest Control Around Gardens and Homes, 2nd Ed.** ANR publication #21385, \$25. Available from ANR catalog (1-800-994-8849 or <http://anrcatalog.ucdavis.edu>) or from Cooperative Extension offices.

**UC Integrated Pest Management Guidelines** [www.ucipm.ucdavis.edu](http://www.ucipm.ucdavis.edu)

**Food Safety News** <http://www.foodsafetynews.com/>

### Water testing labs

To find a lab in your area, you may want to call your local county Public Health or Environmental Health Department. Look in the blue pages in the phone book for county government section, and look for department of 'Public Health' or 'Environmental Health'. It is important to note the type of water you need to have tested. Many laboratories do not handle surface water and may not be capable of providing a quantitative test, so be sure to outline the type of water you have and the test you need.

A long list of water testing labs certified by CA State Public Health Department is available at [http://www.swrcb.ca.gov/gama/domestic\\_wells\\_testing.shtml](http://www.swrcb.ca.gov/gama/domestic_wells_testing.shtml) (Excel is required to open this list)

### **Companies and Agencies that will do 3<sup>rd</sup> Party Audits**

- ✦ **US Dept of Agriculture** – contacts for various states <http://www.ams.usda.gov/AMSV1.0/GAPGHP>
- ✦ **California Department of Food and Agriculture - Inspection and Compliance**  
Dinuba, California Telephone: 559-595-8000
- ✦ **AIB International** – Kansas, Telephone 800-633-5137
- ✦ **NFS Davis Fresh Technologies** – Watsonville, CA Telephone 831-768-7951
- ✦ **Primus Labs** – Santa Maria, CA Telephone (805) 922.0055
- ✦ **Scientific Certification Systems** – Emeryville, CA Telephone 510.452.8024
- ✦ **Silliker** – Modesto, CA Telephone 209/521 5503
- ✦ **Global GAP** – Germany Telephone +49 (0) 221 57 993-25
- ✦ **ISO International Standards Org** – Switzerland Telephone +41 22 749 01 11

*\*This list is not all-inclusive*

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## PRECONFERENCE SHORT COURSES

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### **New and Emerging Technologies for Enhancing Small Farm Profitability**

Robin G. Brumfield

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Farm decision-making must be based on accurate and timely information (Brumfield, 2010). Adopting and integrating technology into marketing practices enhances competitive advantage by amplifying marketing messages through record keeping and cost accounting programs. A simple Rutgers Cost Accounting Program, developed in Microsoft Excel and distributed by Rutgers University lets farmers determine the costs and returns of each crop that they produce. The program calculates costs of crops produced outdoors as well as greenhouse crops. It generates information showing total costs, and net returns per unit. It enables producers to easily determine the profitability of each crop. From this information, they can determine which crops are their winners and losers. This software also will help farmers make decisions on pricing, identifying and reducing unprofitable production costs and increasing sales of profitable crops.

The Rutgers Cost Accounting Program calculates the percentages of each overhead cost by using information that growers take from their income statement and input into the program. The program combines this with information from the balance sheet, to calculate 17 key financial ratios. In addition to analyzing their actual costs, farmers can use the program as a planning tool to analyze the impact of increased costs, changes in prices, changes in marketing mixes, or other changes they are considering.

Tables 1 and 2 show figures from an example Northeast farm with sales of \$2.2 million, and net returns of \$211,455 or 9.5%. The farm has a 138,759 square feet greenhouse and grows petunia flats, marigold flats, geranium flats, geraniums in 4-inch pots, poinsettias in 6-inch pots and an acre of outdoor cut flowers. Table 1 shows basic production inputs needed to calculate cost per square foot per week. Table 2 summarizes information from the income statement and calculates each cost as a percentage of sales. If we take those same numbers and triple energy costs (which has happened over the last decade), the net losses are \$37,585 or -1.7% of sales. Taking this further, we can use the program to show that if we inflate prices of crops by 5% after increasing fuel costs, the net returns become positive (Tables 2 and 3). All crops, both greenhouse and outdoors, are profitable in in the base example, but, when we increase energy costs, then geranium flats and poinsettias become unprofitable. If we then increase sales prices by 5%, the net returns for the greenhouse become positive (\$73,393), but poinsettias and geranium flats are still slightly unprofitable.

One method of assessment is financial analysis using financial ratios. Using numbers from the balance sheet and income statement, the program calculates the ratios which fall into four categories: profitability, financial efficiency, liquidity, and solvency. Table 4 shows the results from the base example. The program calculates each ratio, gives a recommendation for what the ratio should be, shows the formula for calculating the ratio, and provides an explanation as to what the ratio means for the farm.

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With rising energy costs and competitive markets, managers need to pay close attention to the bottom line and how changes in costs impact it. The Rutgers Cost Accounting Program allows farmers to do “what if” planning on paper instead of making bigger, real mistakes on the farm. For more information, contact Dr. Robin G. Brumfield, 55 Dudley Road, Rutgers University, New Brunswick, NJ 08901-8520, phone 848/932-9130, e-mail: Brumfield@aesop.rutgers.edu.

**Literature Cited**

Brumfield, R.G. 2010. Strategies Producers in the Northeastern United States Are Using to Reduce Costs and Increase Profits in Tough Economic Times. HortTechnology 20(5):836-843.

Table 1. An example of production inputs, which includes names of specific crops, number of units started, area used to produce each unit, production time, percentage sold, and sales price.

	<b>Crops</b>					
	<b>Petunia</b>	<b>Marigold</b>	<b>Geranium</b>	<b>Geraniums</b>	<b>Poinsettias</b>	<b>Outdoor Cut Flowers</b>
	<b>flats</b>	<b>flats</b>	<b>flats</b>	<b>(4-inch pots)</b>	<b>(6-inch pots)</b>	<b>(bunches)</b>
Number of units started	50,000	50,000	50,000	100,000	126,000	26,136
Square feet per unit	1.64	1.64	1.64	0.11	1	1 acre
Weeks to grow	8	6	13	6	15	15
Percent sold	0.98	0.98	0.98	0.95	0.95	0.95
Sales price	\$7.93	\$7.00	\$11.73	\$1.66	\$5.46	\$4.00

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Table 2. Baseline income statement data, the same data except for tripled energy costs, and the same data with tripled energy costs and sales prices being increased by 5%.

	<i>Base</i>		<i>Tripled Fuel Costs</i>		<i>Tripled Fuel Costs/ Sales Prices Increased 5%</i>	
	\$	% of Sales	\$	% of Sales	\$	% of Sales
<b>Sales</b>	<b>\$2,219,560</b>	<b>100.0%</b>	<b>\$2,219,560</b>	<b>100.0%</b>	<b>\$2,330,538</b>	<b>100.0%</b>
<b>Directs costs</b>						
Seeds, cuttings, or plants	\$490,540	22.1%	\$490,540	22.1%	\$490,540	21.0%
Pots or containers	\$141,180	6.4%	\$141,180	6.4%	\$141,180	6.1%
Marketing containers	\$6,915	0.3%	\$6,915	0.3%	\$6,915	0.3%
Growing medium	\$37,341	1.7%	\$37,341	1.7%	\$37,341	1.6%
Fertilizer and chemicals	\$40,753	1.8%	\$40,753	1.8%	\$40,753	1.7%
Tags	\$60,160	2.7%	\$60,160	2.7%	\$60,160	2.6%
Sales Commissions	\$2,875	0.1%	\$2,875	0.1%	\$2,875	0.1%
Other	\$998	0.0%	\$998	0.0%	\$998	0.0%
<b>Overhead salaries (including benefits)</b>	\$42,562	1.9%	\$42,562	1.9%	\$42,562	1.8%
<b>General wages (including benefits)</b>	\$728,496	32.8%	\$728,496	32.8%	\$728,496	31.3%
<b>Utilities</b>						
Heating fuel/Machinery Fuel	\$77,566	3.5%	\$232,698	10.5%	\$232,698	10.0%
Electricity	\$40,352	1.8%	\$40,352	1.8%	\$40,352	1.7%
Telephone	\$5,894	0.3%	\$5,894	0.3%	\$5,894	0.3%
Water	\$464	0.0%	\$464	0.0%	\$464	0.0%
<b>Overhead</b>						
Depreciation	\$92,642	4.2%	\$92,642	4.2%	\$92,642	4.0%
Interest	\$8,080	0.4%	\$8,080	0.4%	\$8,080	0.3%
Repairs	\$43,829	2.0%	\$43,829	2.0%	\$43,829	1.9%
Taxes	\$26,131	1.2%	\$26,131	1.2%	\$26,131	1.1%
Insurance	\$37,546	1.7%	\$37,546	1.7%	\$37,546	1.6%
Advertising	\$11,277	0.5%	\$11,277	0.5%	\$11,277	0.5%
Travel and entertainment	\$7,431	0.3%	\$7,431	0.3%	\$7,431	0.3%
Office expense	\$9,589	0.4%	\$9,589	0.4%	\$9,589	0.4%
Professional fees	\$19,444	0.9%	\$19,444	0.9%	\$19,444	0.8%
Truck expense and equipment rental	\$46,954	2.1%	\$140,862	6.3%	\$140,862	6.0%
Land rental	\$2,112	0.1%	\$2,112	0.1%	\$2,112	0.1%
Miscellaneous	\$26,974	1.2%	\$26,974	1.2%	\$26,974	1.2%
<b>Total expenses</b>	<b>\$2,008,105</b>	<b>90.5%</b>	<b>\$2,257,145</b>	<b>101.7%</b>	<b>\$2,257,146</b>	<b>96.9%</b>

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<b>Net Returns</b>	\$211,455	9.5%	(\$37,585)	-1.7%	\$73,393	3.1%
Greenhouse area (ft <sup>2</sup> )	138,759		138,759		138,759	
Greenhouse space used for production (%)		75		75		75
Weeks in operation (52 if a full year)	40		40		40	

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Table 3. An example from the Greenhouse Cost Accounting program of output information per units and per crop using 2003 Northeast cost.

	Crops					
	Petunia	Marigold	Geranium	Geraniums	Poinsettias	Outdoor Cut Flowers
	flats	flats	flats	(4-inch pots)	(6-inch pots)	(bunches)
Sales	\$388,570	\$343,000	\$574,770	\$157,700	\$653,562	\$99,317
Profit (loss) per crop	\$63,004	\$44,950	\$42,911	\$18,350	\$69,918	\$19,201
Profit (loss) per unit	\$1.29	\$0.92	\$0.88	\$0.19	\$0.58	\$0.77
Profit (loss) per sq. ft-wk	\$0.10	\$0.09	\$0.04	\$0.28	\$0.03	\$0.03
Sales price	\$7.93	\$7.00	\$11.73	\$1.66	\$5.46	\$4.00
<b>Everything held constant, but energy costs tripled.</b>						
Sales	\$388,570	\$343,000	\$574,770	\$157,700	\$653,562	\$99,317
Profit (loss) per crop	\$16,464	\$10,045	(\$32,717)	\$13,668	(\$64,169)	\$19,141
Profit (loss) per unit	\$0.34	\$0.21	(\$0.67)	\$0.14	(\$0.54)	\$0.77
Profit (loss) per sq. ft-wk	\$0.03	\$0.02	(\$0.03)	\$0.21	(\$0.03)	\$0.03
Sales price	\$7.93	\$7.00	\$11.73	\$1.66	\$5.46	\$4.00
<b>Everything held constant, but energy costs tripled and sales prices increased 5%.</b>						
Sales	\$407,999	\$360,150	\$603,508	\$165,585	\$686,240	\$104,283
Profit (loss) per crop	\$35,892	\$27,195	(\$3,979)	\$21,553	(\$31,491)	\$24,107
Profit (loss) per unit	\$0.73	\$0.56	(\$0.08)	\$0.23	(\$0.26)	\$0.97
Profit (loss) per sq. ft-wk	\$0.05	\$0.06	(\$0.00)	\$0.33	(\$0.02)	\$0.04
Sales Price	\$8.33	\$7.35	\$12.32	\$1.26	\$5.25	\$4.20

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Table 4. Financial ratios calculated for the example farm presented in the other tables.

<b>Profitability</b> The ability to earn a good profit and generate satisfactory return on investment.				
<i>Measure</i>	<i>Your Figure</i>	<i>Recommendation</i>	<i>Formula</i>	<i>Explanation</i>
<b>Net Income (Profit)</b>	<b>\$211,455</b>	<b>&gt;\$50,000 per family</b>	Sales - Total Costs	What remains after subtracting all the costs (including depreciation, interest, salaries, and taxes) from your sales. Also called <b>bottom line</b> , net earnings, net profit.
<b>Gross Margin</b>	<b>64.82%</b>	<b>30-40%</b>	(Sales - Total Direct Costs) / Sales	The amount of contribution to the business enterprise, after paying direct costs.
<b>Profit Margin</b>	<b>9.53%</b>	<b>10-15%</b>	Net Income / Sales	Profit per dollar of sales after paying the owner's salary and accounting for opportunity cost of capital invested.
<b>Return on Equity</b>	<b>27.89%</b>	<b>&gt;10%</b>	Net Income / Net Worth	Measures how effectively you are using your reserves to produce income.
<b>Return on Assets</b>	<b>17.16%</b>	<b>&gt;10%</b>	Net Income / Total Assets	Measures how you employ your assets to obtain sales revenue.
<b>Financial Efficiency</b> How well you employ your assets.				
<i>Measure</i>	<i>Your Figure</i>	<i>Recommendation</i>	<i>Formula</i>	<i>Explanation</i>
<b>Financial Efficiency Ratio</b>	<b>85.94%</b>	<b>&lt; 65%</b>	(Total Expenses- Interest- Depreciation) / Sales	Measures how you employ your assets to obtain sales revenue.
<b>Asset Turnover Ratio</b>	<b>180.14%</b>	<b>&gt; 25% - 30%</b>	Sales / Total Assets	How you are in utilizing your assets in generation of sales revenue. <b>Higher is better.</b> If low, it indicates the current level of investment needs to be used more efficiently or maybe some capital can be sold without adversely affecting operating efficiency.
<b>Operating Expense Ratio</b>	<b>10.78%</b>	<b>&lt;65%</b>	(Operating Expense - Depreciation) / Sales	For every dollar we took in, <b>how much did we need to spend?</b>

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<b>Depreciation Expense Ratio</b>	4.17%	< 15%	Depreciation Expense / Sales	Provides a measure of the capital costs incurred by the firm.
<b>Interest Expense Ratio</b>	0.36%	< 15%	Interest Expense / Sales	Shows percent of your income needed to pay interest.
<b>Liquidity</b> The ability of the firm to meet its current obligations without disrupting normal business operations.				
<i>Measure</i>	<i>Your Figure</i>	<i>Recommendation</i>	<i>Formula</i>	<i>Explanation</i>
<b>Current Ratio</b>	1.85	>1.5	Total Current Assets / Current Liability	Measures the ability to satisfy current debts with current assets.
<b>Working Capital</b>	\$207,162	Positive, Stable	Total Current Assets - Total Current Liabilities	Approximates the amount of funds available from within the business to purchase crop inputs and equipment necessary to produce products. In general, a lot of working capital = more success since you can expand and improve operations.
<b>Solvency</b> The ability to meet loan payments.				
<i>Measure</i>	<i>Your Figure</i>	<i>Recommendation</i>	<i>Formula</i>	<i>Explanation</i>
<b>Debt/Asset Ratio</b>	38.47%	<30%	Total Liabilities / Total Assets	Measures the percentage of your total assets to which creditors have claims. Measures financial risk with debt financing. If = 0, the firm is out of debt.
<b>Equity/Asset Ratio</b>	61.53%	<60%	Total Equity / Total Assets	What <b>portion</b> of the business <b>YOU own</b> .
<b>Debt/Equity Ratio</b>	62.51%	<150%	Total Liabilities / Net Worth	What <b>portion</b> of the business <b>YOUR LENDERS own</b> .
<b>Working Capital Ratio</b>	10.32%	>50%	(Current Assets- Current Liabilities)/Total Expenses	Measures the return on your assets without regard to how the firm is financed.
<b>Leverage Factor</b>	1.625	5	Total Assets / Net Worth	A measure of the firm's riskiness. It is the ratio of your assets to your net worth.

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## New and Emerging Technologies for Enhancing Small Farm Profitability

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The global e-marketplace positions small farm businesses for increased profits through social media and smartphone technologies (Berthon, et al., 2012). Integrating computer and mobile systems (smartphone) into small farm marketing strategy provides financial rewards (Reinartz et al., 2011). The traditional 4Ps marketing mix of product, price, place, and promotion must be retooled to incorporate ePs (Chea, et al., 2012). The ePs consider participation, personalization, promptness, and privacy within the e-marketplace environment (Chea et al., 2012).

Understanding differences between social media applications informs marketing strategy in consumer driven promotions (Smith, Fischer, & Yongjian, 2012). Worldwide there are 1.08 billion smartphones in use and by 2014 smartphone internet use will exceed desktop internet use (DigitalBuzz, 2011). Small farmers can profit from integrating smartphone technologies to communicate, educate, and make credit card transactions. Remaining competitive in the 21<sup>st</sup> century marketplace means adopting emerging mobile technology in practical ways. The purpose of this educational bulletin is to explain the mobile commerce (m-commerce) concepts of QR codes and smartphone credit card transactions.

### What is a QR Code?

A QR code is an acronym for the term: Quick Response Code. The QR code is a two-dimensional matrix bar code that is used to identify products (Fig. 1).



Fig.1 QR code example

### Who uses QR codes?

Did you know 50 percent of smartphone owners have scanned a QR code and one in five smartphone users buy a product after a QR code scan? (Tode, 2012).

Luxury brands introduced QR codes in prestige consumer products within the US marketplace focusing on: (a) electronics, (b) specialty foods, (c) organics, and (d) socially conscious positioned categories.

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## QR Code Scanner Downloaded Needed by Smartphone Users

To begin scanning QR codes a smartphone user must download the appropriate mobile application for their specific phone.

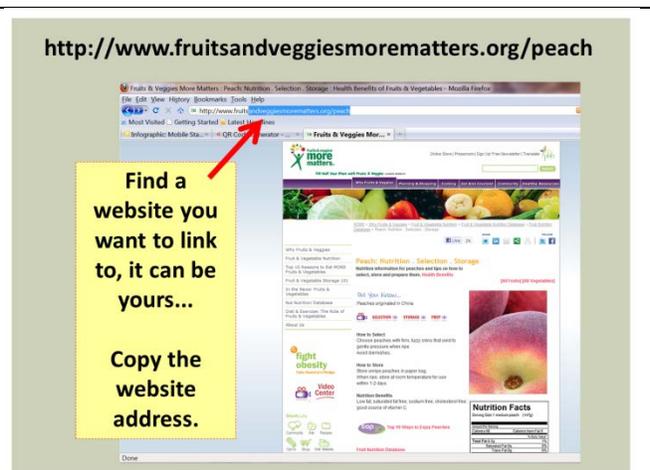
Consumers can conduct a Google Search for: QR reader. Denso Wave the makers of QR code technology provided a useful webpage of downloadable QR scanners for different smartphones: <http://2d-code.co.uk/qr-code-readers/>

## Steps for Creating a QR Code Example to Reference a Webpage

### Step 1:

Choose a website. You can select your farm webpage. In this example a nutritional website is being used.

Go to the address bar and copy the website address.



### Step 2:

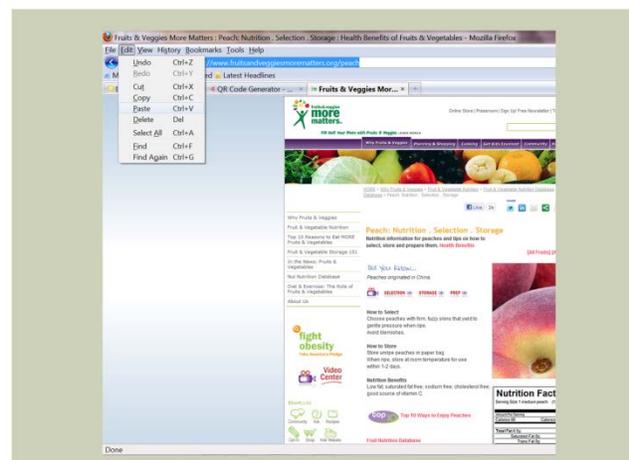
To copy the website address completely,

Highlight the entire website address

Go to top menu bar

Select EDIT

Choose COPY



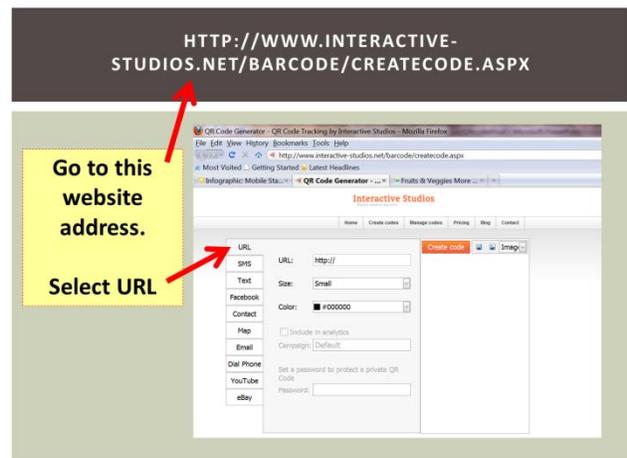
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## Step 3:

Go to the QR creator website:

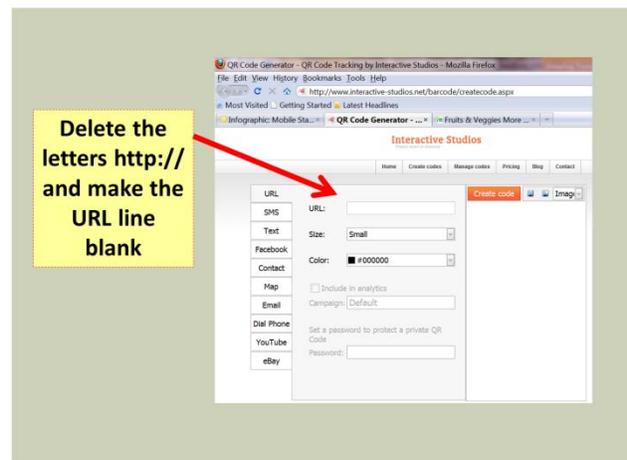
<http://www.interactive-studios.net/barcode/createcode.aspx>

Click on URL choice



## Step 4:

Beside the word URL, delete the letters http:// and make the URL line blank

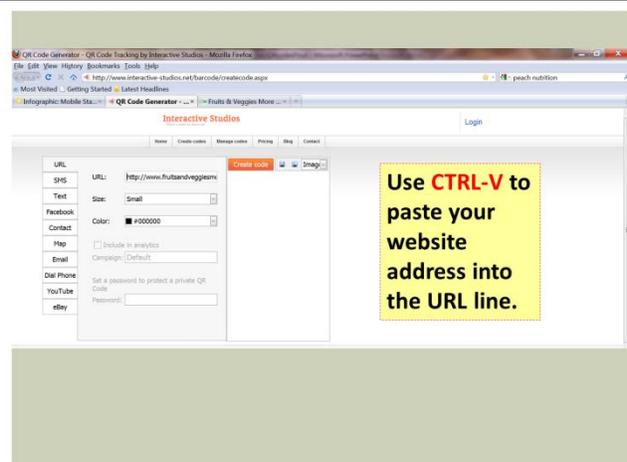


## Step 5:

Put your cursor in the URL: blank section

Press the CTRL and the V keys at the same time

Your website address should appear in the URL: blank section



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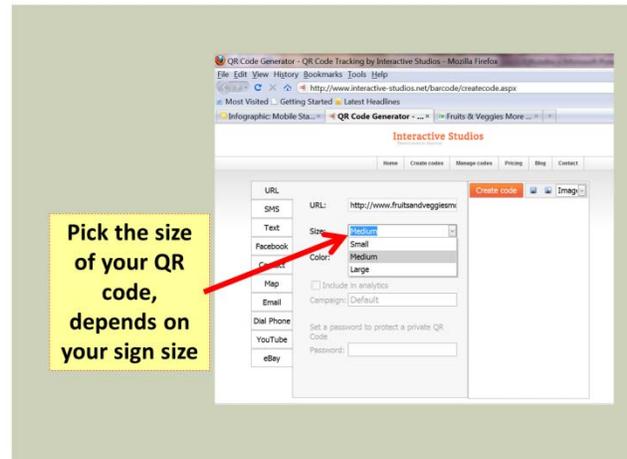
## Step 6:

Use the drop down menu to pick the size of your QR code.

Small for a business card

Medium for a brochure or small price sign,

Large for a poster

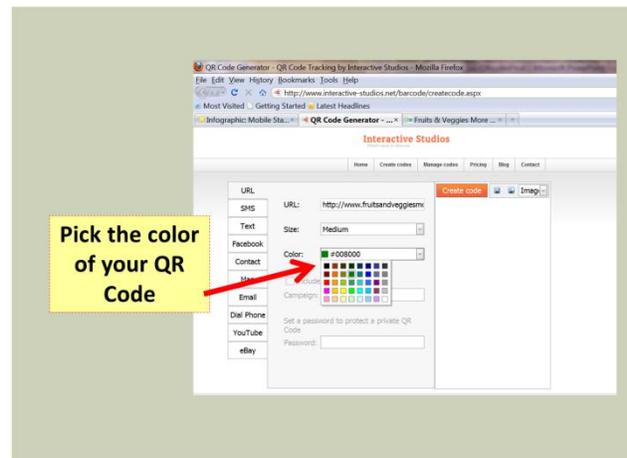


## Step 7:

Pick the color of your QR code

Green is nice for natural food products

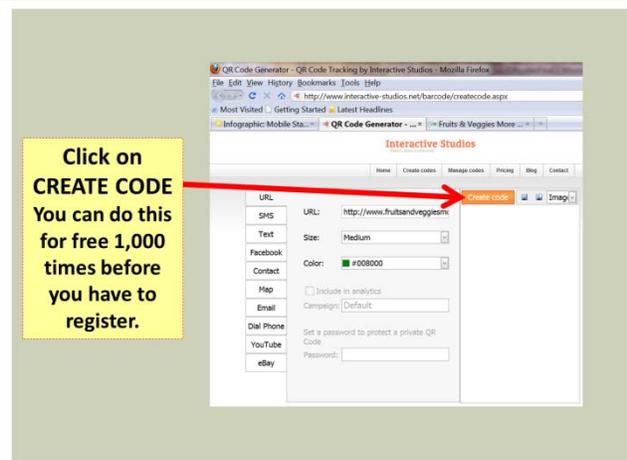
You can match the color with the vegetables you are selling



## Step 8:

Click on CREATE CODE

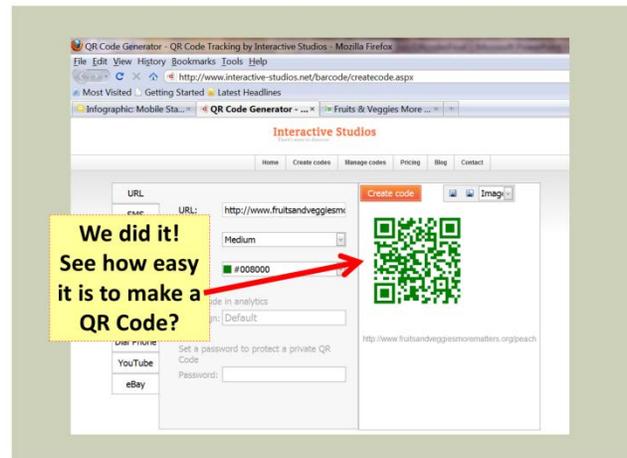
This service is free for 1,000 times before you have to register your information.



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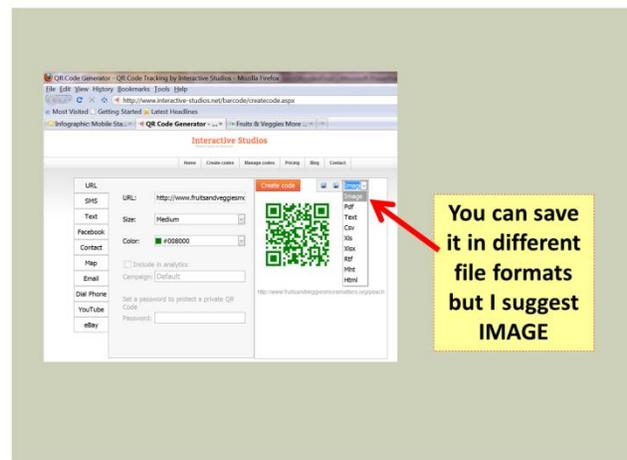
## Step 9:

Smile. You made a QR code. If you have a smartphone QR code scanner, try it. Does it go to the website you selected?



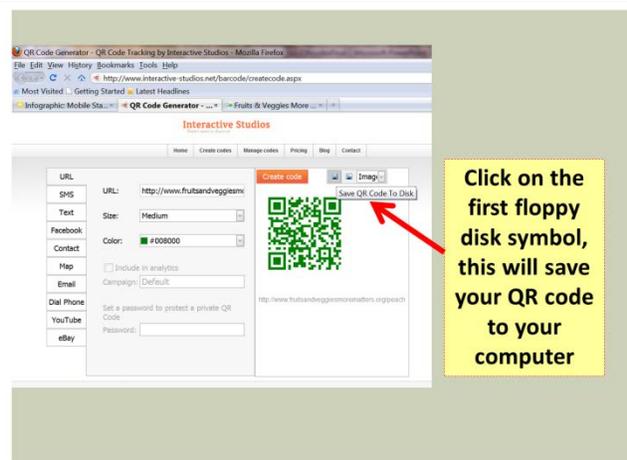
## Step 10:

Save your QR code image to use in your printed and web promotional pieces.



## Step 11:

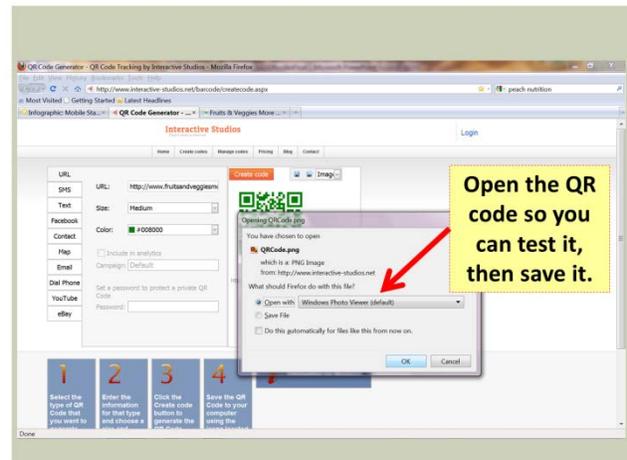
Click on the floppy disk symbol to save the image file to your computer



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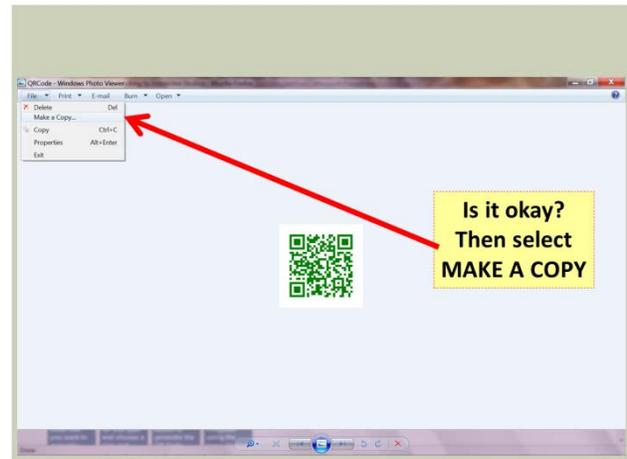
## Step 12:

Open your QR code to retest image and save it



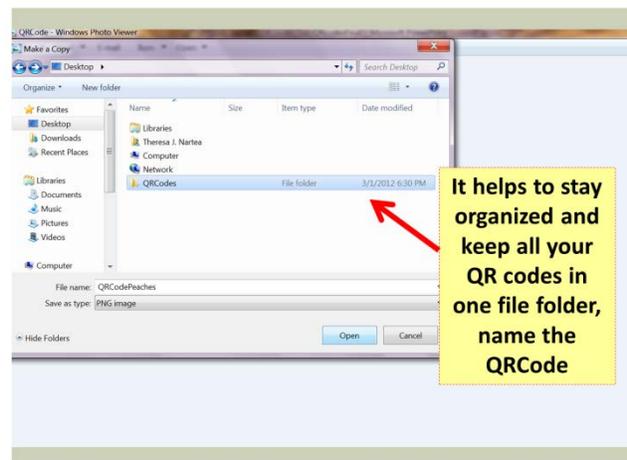
## Step 13:

Go to FILE  
Select MAKE A COPY



## Step 14:

Save your QR codes in one place on your computer so you can find them later. Try to name them a special name that will help you remember what they were for



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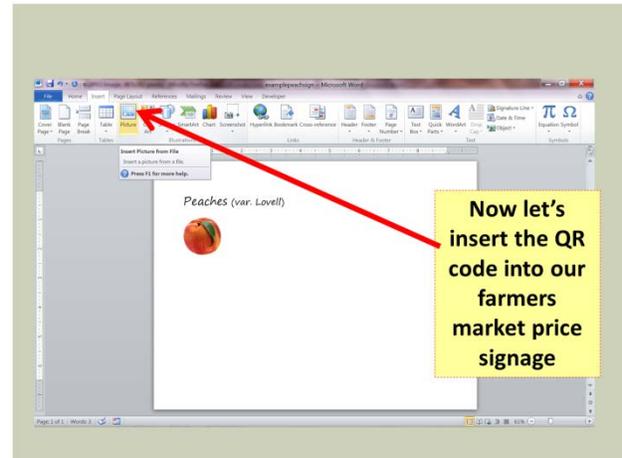
## Step 15:

You can make a sign in Microsoft Word.

Click on INSERT menu

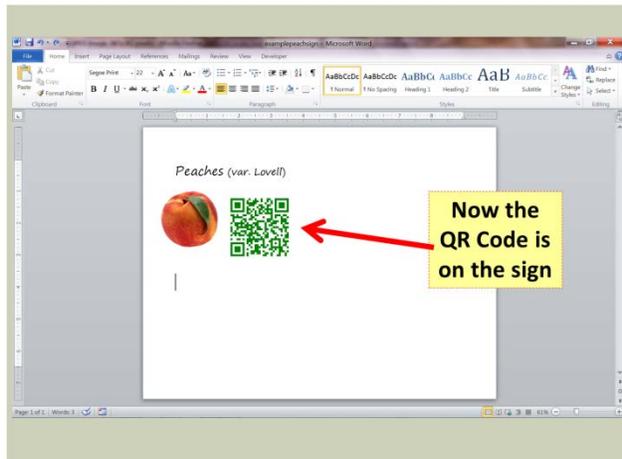
Select PICTURE

Choose INSERT PICTURE FROM FILE



## Step 16:

Now your QR code is on the sign!



## Step 17:

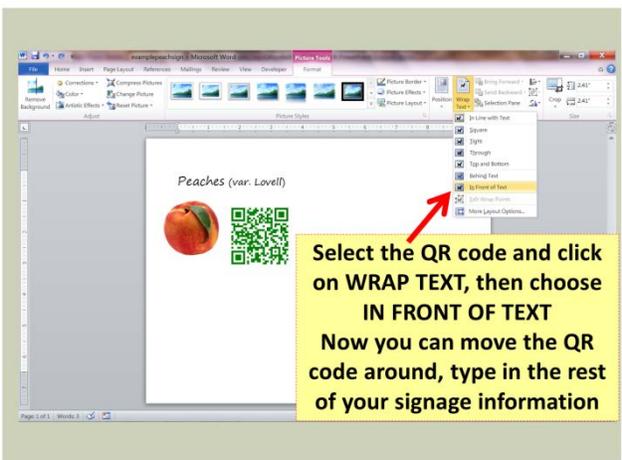
Select the QR code

Using PICTURE TOOLS menu

Click on WRAP TEXT

Choose IN FRONT OF TEXT

This allows one to move the QR code around on the page.



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## Step 18:

Add your flourishes and you are done!

Consider specific recipe pages, or nutritional webpages to take customers to, good ones are:

World's Healthiest Foods:

<http://www.whfoods.com/foodstoc.php>

Fruits and Veggies More Matters:

<http://www.fruitsandveggiesmorematters.org>



## Consider using QR codes for different purposes:

Business cards, Website homepages, educational signage, product information.

To change the type of QR code select from the choices available in Step 3 of these directions.



## Smartphone Credit Card Acceptance

Consumer spending self-control is reduced with the availability of a credit card (Haws, Bearden, & Nenkov, 2011). Consumers are less concerned with pricing and are more likely to impulse buy when using a credit card over paying with actual cash (Thomas, Desai, & Seenivasan, 2010). Small farmers who understand consumer purchasing behavior will profit when they have the ability to accept credit cards. Identify and target consumers that are college-age, wear trendy clothing, or carry a smartphone. Consider asking target customers what items they desire to

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purchase most. This customer segment places value on conveniently pre-packaged and prepared foods.

### Evaluating Potential Companies

Review the following table to determine the best fit for your business needs. Go to the listed websites to find out the most current information since costs are subject to change.

Company	Website	PROS	COST
Square Up	<a href="https://squareup.com">https://squareup.com</a>	Simple set up, free hardware, no monthly costs	2.75%/swipe + 15 cents; \$10 = 42 cents charge You take home \$9.57
Intuit	<a href="http://gopayment.com">http://gopayment.com</a>	Simple interface, can tap on frequent purchase items instead of manual input	\$13/month; 1.7%/swipe + 30 cents; \$10 = 47 cents charge You take home \$9.53
RoamData RoamPay	<a href="http://www.roamdata.com">http://www.roamdata.com</a>	Works with 200+ phones	\$150/year; 1.95%/swipe; \$45 hardware fee \$10 = 19.5 cents charge You take home \$9.805
PhoneTransact iMerchant Pro	<a href="http://www.phonetransact.com">http://www.phonetransact.com</a>	Requires a password, simple interface, makes cash register sound after sale is made	Software \$1 for iPhone; Hardware \$100; \$34/month; 1.69%/swipe + 24 cents \$10 = 42 cents charge You take home \$9.57
PayWare Mobile	<a href="http://www.paywaremobile.com">http://www.paywaremobile.com</a>	Elegant and includes a stylus to use for signature; iPhone	\$20/month; \$45 setup fee; \$115 hardware fee; 1.59%/swipe + 25 cents \$10 = 40.9 cents charge You take home \$9.591

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Smith, A. N., Fischer, E., Yongjian, C. (2012). How does brand-related user-generated content differ across YouTube, Facebook, and Twitter? *Journal of Interactive Marketing*. doi:10.1016/j.intmar.2012.01.002

Thomas, M., Desai, K. K., & Seenivasan, S. (2010). How credit card payments increase unhealthy food purchases: Visceral regulations of vices. *Journal of Consumer Research*, 38(1), 126-139. doi:0093-5301/2011-3801-0001

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### Key Concepts for Developing a Business Plan

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Farmers who want to consider adding a value-added agriculture enterprise should carefully evaluate their personal attributes, skills and values as they develop a business plan. Value-added entrepreneurs must continue to juggle all the challenges of producing a raw commodity while adding new challenges such as managing additional labor, budgets and finances, operating equipment, marketing products, understanding and complying with regulations and maintaining records. Successful entrepreneurs are usually self-starters, highly organized, goal-oriented and effective communicators. They are self-confident and life-long learners who carefully consider whether they have the skills and resources needed to develop their enterprise, as well as whether they are willing to make any sacrifices required to make the enterprise profitable. They also consider the potential quality of life, labor and financial implications this could have on their family. A personal evaluation exercise listed in *Agritourism in Focus* at [https://utextension.tennessee.edu/publications/Documents/PB1754\\_ch2.pdf](https://utextension.tennessee.edu/publications/Documents/PB1754_ch2.pdf) will help a prospective entrepreneur evaluate how he/she compares to successful entrepreneurs.

Values represent an individual's highest priorities and these values influence business objectives. Consideration should be given to the type of life one wants to lead, things considered financially important, and values relative to the environment and community. It's a good idea for the entrepreneur to share values with other planning team members so values can be identified that are held in common. It's also important for team members to become aware of the different values held by each planning team member. This will make goal setting and conflict resolution easier down the road. Ideally, by gaining an understanding of what motivates each planning team member, the entrepreneur will be able to develop goals that everyone can commit to and support.

A business plan is a document that defines the values, goals, challenges and strategies for a business. A business plan helps the entrepreneur determine the potential feasibility of a venture before committing resources. It shows where the business is going and how it will get there. It is an important document that helps sell the idea to bankers and partners who will have a vested interest in the business. It's also helpful to have a team of trusted advisors who can review the business plan. These advisors may include family members, bankers, lawyers, potential customers and investors. They may think of things that can affect the market for the product that the entrepreneur hasn't considered.

The components of a business plan include:

- Executive Summary

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- Mission Statement
- Goals and Objectives
- Situational Analysis
- Marketing Strategy
- Financial Strategy
- Management Needs and History
- Contingency Strategy

Our discussion will focus on the financial strategy section. The financial statements that should be included in the business plan are the balance sheet, income statement and cash flow statement. A balance sheet is a summary of the business's financial condition at a specific point in time. It lists the assets (financial resources that are available) and liabilities (debts owed). The difference between the assets and liabilities is the owner's equity. The owner's equity is a measure of the owner's ability to withstand future risks.

The income statement shows the business's income and expenses over a given period, such as a year. The difference between income and expenses is profit or loss. A cash flow statement shows how changes in balance sheet accounts and income affect cash and cash equivalents. The cash flow statement shows all the flow of cash in and cash out of the business.

For a farm business that is considering adding a value-added enterprise, it is a good idea to prepare two income statements—one for the existing business and another for the proposed value-added business. This will help the owner compare anticipated returns of the value-added enterprise with the existing business and will allow an analysis of costs of production. Amortized start-up costs and operating costs must be considered along with the projected volume of sales units to arrive at a selling price that will allow the owner to break even. For example, a small orchard owner who wants to add an on-farm roadside market might have projected total start-up and operating costs of \$45,178. If 4,285 baskets are the expected volume of sales units, the breakeven price would be  $\$45,178 \div 4,285$ , or \$10.54 per basket. The breakeven price is the price at which a business neither incurs a profit nor incurs a loss. Breakeven analysis is a useful planning tool because it shows the minimum level of activity required to stay in business. Breakeven analysis can also help a business determine the sales volume required to reach a particular profit target. However, breakeven analysis is based on assumptions and these assumptions may change. In the previous example, these assumptions include:

- The orchard owner expects to produce 4,285 baskets each year.
- A market can be developed in a single year and all the fruit will be sold at the roadside market.
- The value-added enterprise will remain in business for the duration of the period chosen to amortize start-up costs.

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- The projected costs are known and will not change.

When determining a selling price for the value-added product, the price at which competitors sell their products must be considered. Traffic flow at the proposed location, the income level of target consumers and the length of time required to develop a market for the product are also important considerations. If the orchard owner determines that \$12 per basket is a reasonable selling price, then the breakeven level of production may be calculated by dividing total costs by the selling price. In this case, the breakeven level of production or sales volume needed to break even would be  $\$45,178 \div \$12$ , or 3,765 baskets. This information is useful in helping to determine whether there will likely be enough customers and sales of the product to cover costs. However, this must be tempered with the reality that the supply of available fruit may not match customers' demand. Breakeven analysis is based on averages and the fruit ripening process is affected by factors such as precipitation, sunlight and temperature. There may be times where there will be more fresh product available for sale than there are customers to buy it.

Successful entrepreneurs know the importance of keeping good records that may be used to monitor operations and control costs. Good records provide critical information that enables the entrepreneur to plan effectively. They also provide a means for the entrepreneur and lender to evaluate performance and project the timing of cash flows and loan repayment.