Produce Food Safety for Small-scale Farms

May 3, 2012

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On-farm Produce Food Safety

We will cover:

PRODUCE

- ✓ **Growing**
- ✓ **Harvesting & Packing**
- ✓ **Transporting**

We won't cover:

Food preparation

- – **Fresh cut produce**
- – **Processing**
- – **Food preservation**

Meat, eggs & dairy

University of California
UC Food Safety

SKIP TO CONTENT SITE MAP Enter Search Term

http://ucfoodsafety.ucdavis.edu

- Home
- Consumer Advice
- Home Food Preservation
- Food Industry Contacts
- Food Safety Modernization Act
- Retail and Food Service
- Processing Foods
- Process Validation
- Produce - Preharvest
- Produce - Postharvest
- Low Moisture Foods
- UC Publications
- Food Safety Links
- Group Info
- ANR Links

UC Food Safety Home

Welcome to the University of California Food Safety website. Research and Extension faculty at
(Drs. Linda Harris and Trevor Suslow) are the hosts for this site but current information from
will be included. From here link to presentations, publications, and other websites with informa
the production, harvest, and processing of foods. The emphasis is on microbial food safety bu
subjects related to food such as biotechnology, food quality and food security are also addres

Newly Added to Website - April 2012

The Bad Bug Book (FDA, 2nd edition)

USDA.gov Flickr Photostream

Calendar

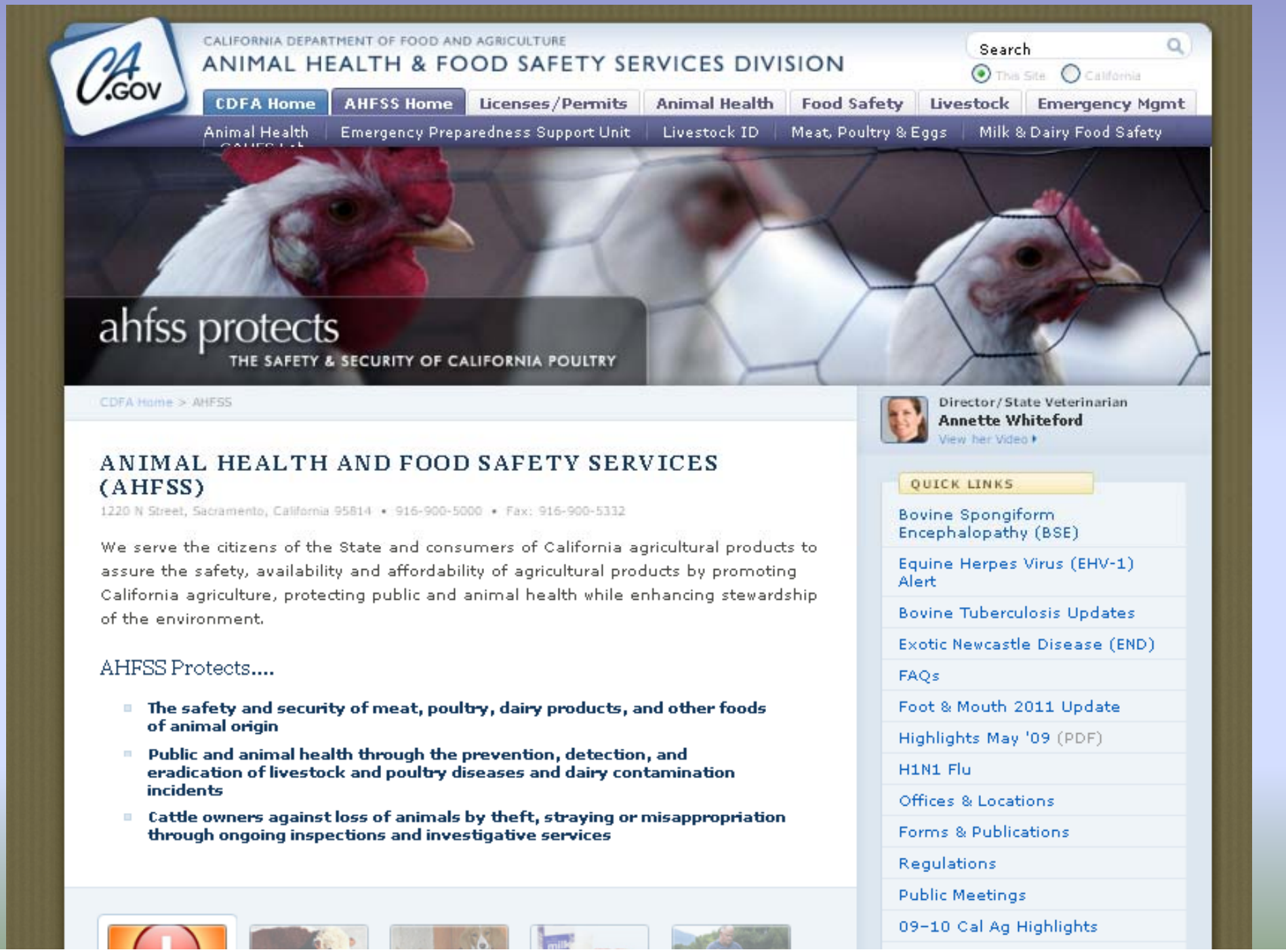
Event Name	Date
Microbial Challenge Testing for Foods Workshop	5/1/2012

View More Events

UC Food Blog

Cultivating
Posted 5/1,
California c
be converte
nation's salad bowl. In

www.cdfa.ca.gov/ahfss/



animalscience.ucdavis.edu/avian/qap.htm

- Home
- Program Information
- HACCP
- Implementation
- California Egg Quality Assurance Plan
- California Poultry Meat Quality Assurance Plan
- Forms
- Video
- Contact Information
- Training Material

Animal Production Food Safety Education Programs for the Poultry Industry

Sponsored by
United States Department of Agriculture, Food Safety and Inspection Services

California Egg Quality Assurance Plan

California Poultry Meat Quality Assurance Plan

Developed by the California egg and poultry meat industries in cooperation with the California Department of Food and Agriculture; U.S. Department of Agriculture; University of California Cooperative Extension; California Veterinary Diagnostic Laboratory System; California Department of Health Services; and the U.S. Food and Drug Administration

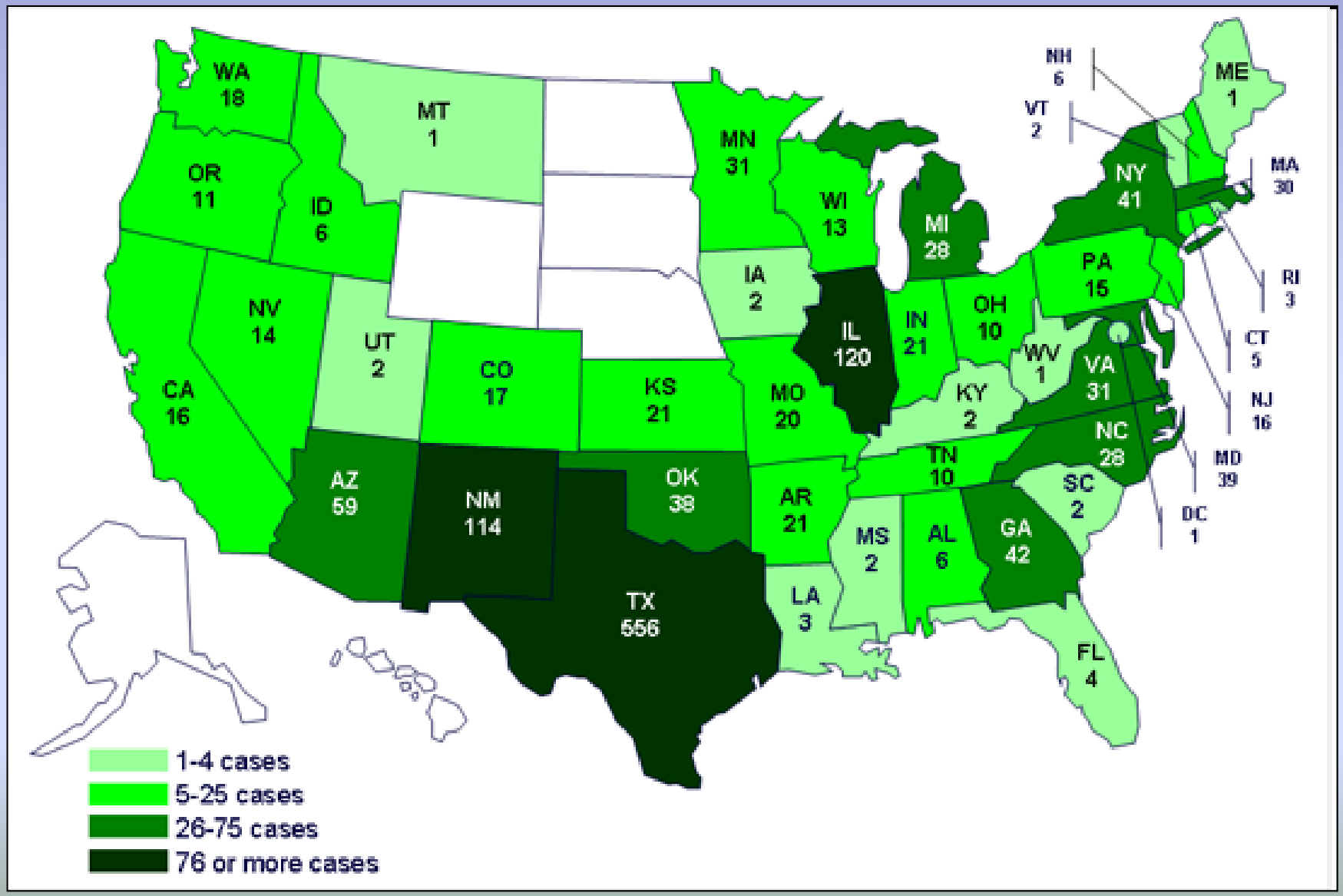
The California Egg and Poultry Meat Quality Assurance Plans are voluntary producer oriented animal production food safety programs designed to ensure the highest quality and safety of poultry and poultry products. These programs utilize Hazard Analysis Critical Control Points (HACCP) principles on the farm to maintain a safe and wholesome product. Training, record keeping, testing and research are integral components in documenting the success of the plan.

Each farm participant designs their own monitoring plan applicable to their specific operation. Farms and processing facilities are periodically reviewed by California Department of Food and Agriculture veterinarians to ensure compliance with all program requirements.

The California Egg and Poultry Meat Quality Assurance Plans enjoy a high level of participation. The enrolled farms about 95 percent of the state's egg and poultry meat production. No other state or national voluntary quality ass that level!

Is this safe to eat?

Number of Sickened People - *Salmonella* Saintpaul by state, as of August 19, 2008



“Small Farms” May Be Responsible for Large Multi-State Outbreaks

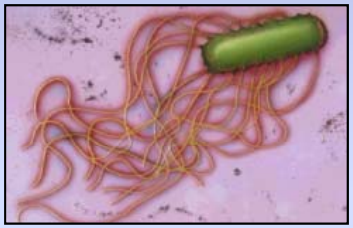
Local Fresh Strawberries Tainted With E. coli O157:H7 Sicken 14, One Dies

- Locally grown berries in NW Oregon, 2011
- Sold at U-pick, farm stands, farmers markets
- Consolidated berries from several farms

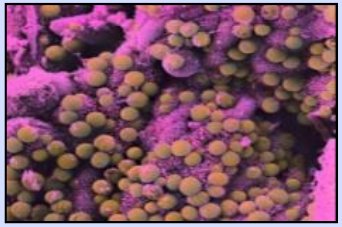



Reported *outbreaks* linked to FDA-regulated foods, *by agent*, 1996-2009 (N=532 outbreaks)

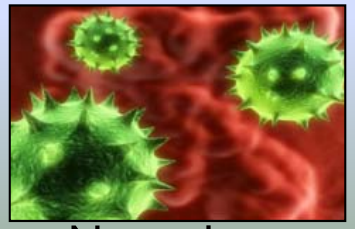
E. coli O157:H7



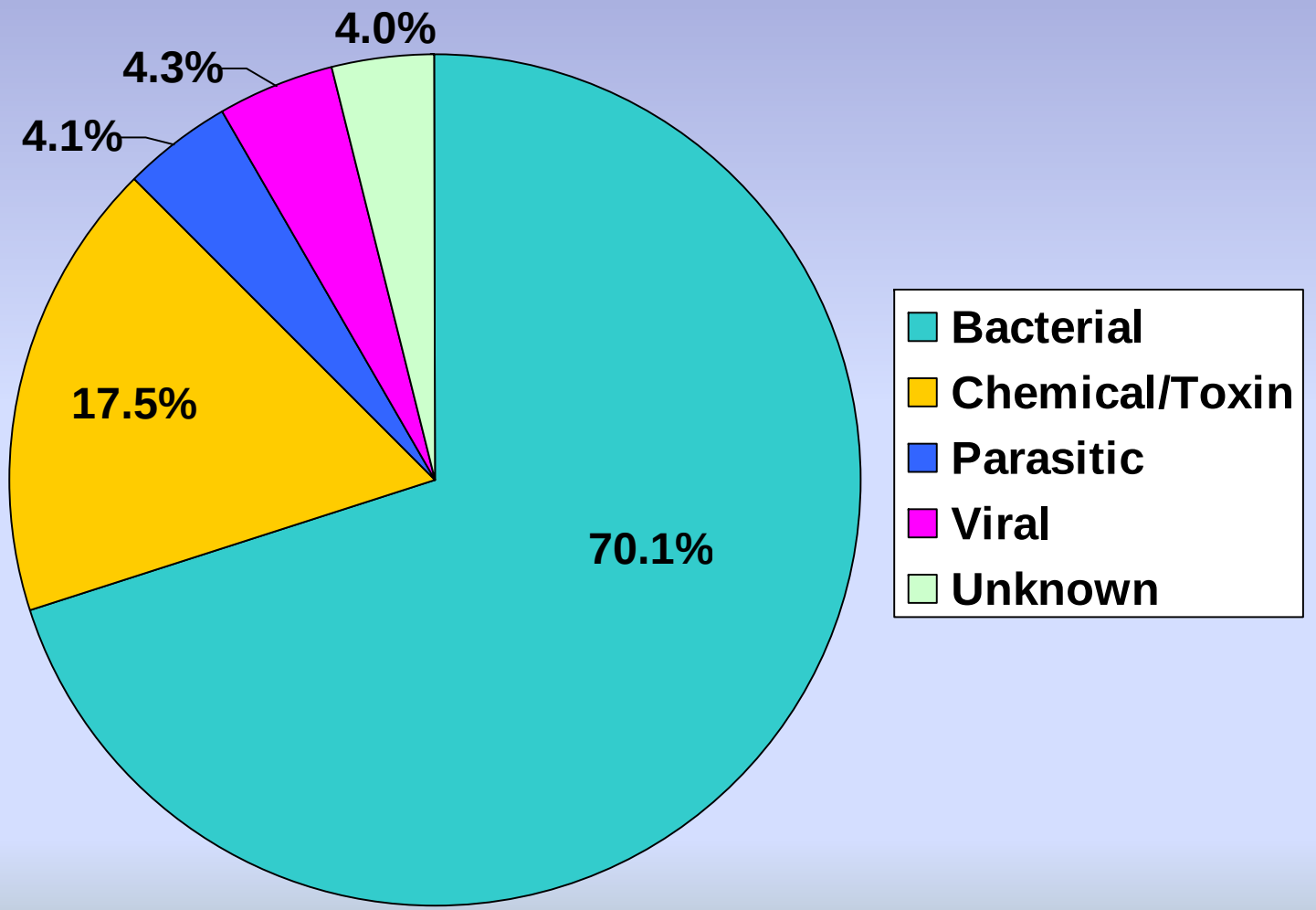
Salmonella



Cryptsporidium

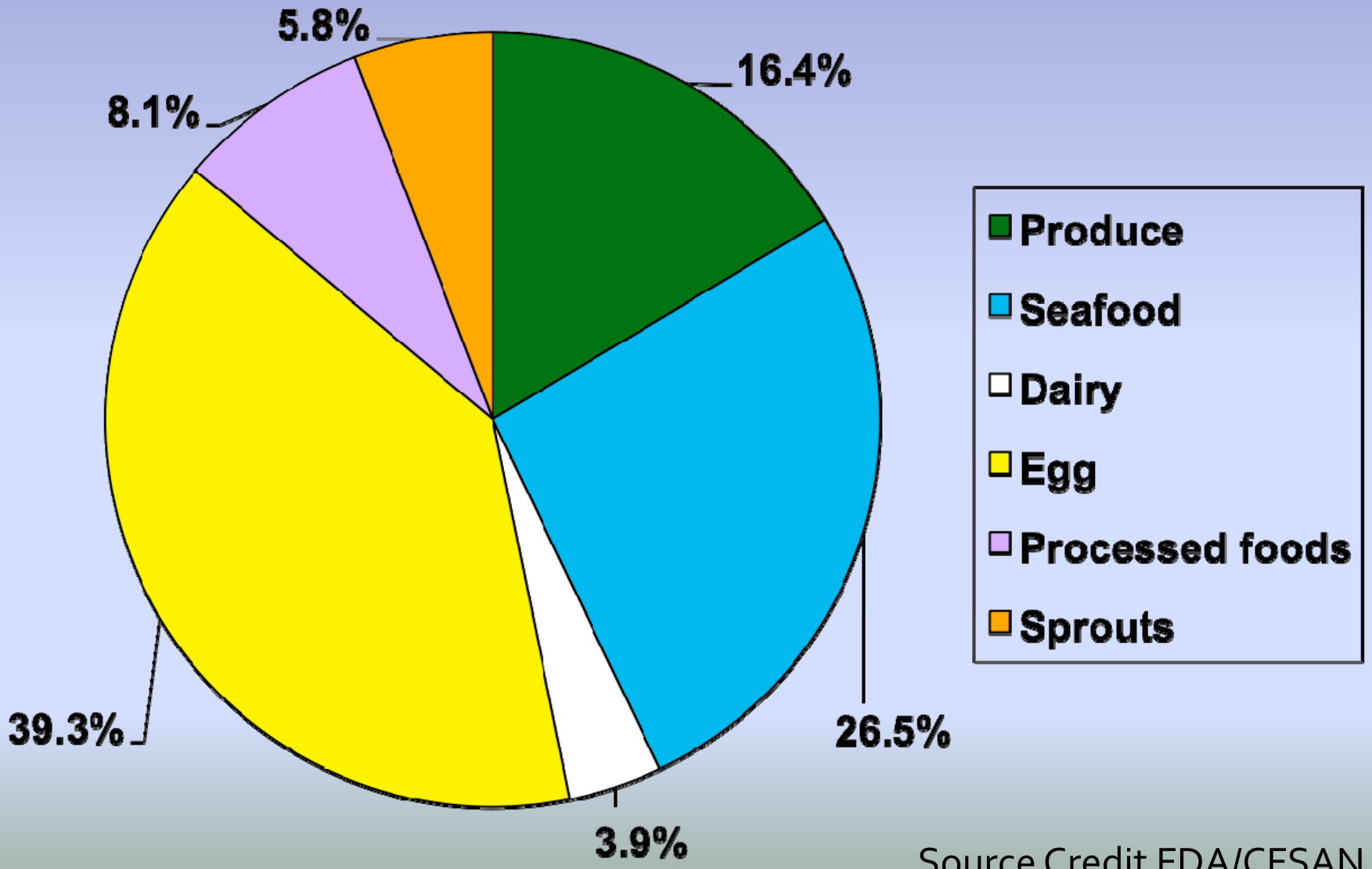


Norovirus



Source Credit
FDA/CFSAN 2011

Reported *outbreaks* linked to FDA-regulated foods, by *vehicle*, 1996-2009 (N=532 outbreaks)

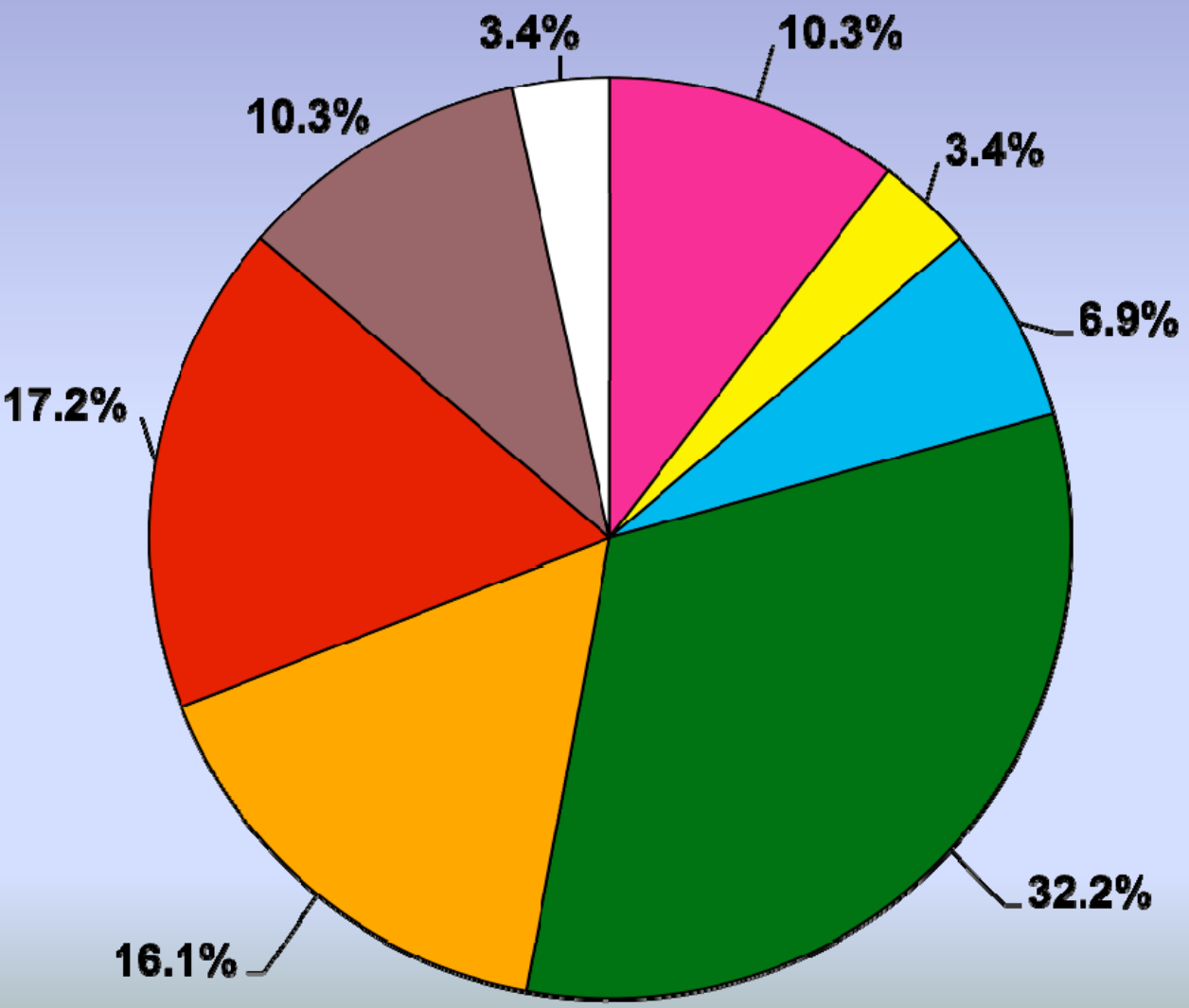


Source Credit FDA/CFSAN 2011

Why is Produce a Risk?

- Pathogens are killed by heat, but produce is often eaten raw
- Surfaces of fruits and vegetables provide hiding places for pathogens
- If pathogens grow into the produce, no amount of washing will remove them

Types of produce Associated with Outbreaks, 1996-2009 (N=87)



- Berries
- Green onions
- Herbs
- Leafy greens
- Melons
- Tomatoes
- Others
- Unknown

65.5 %

Source Credit FDA/CFSAN 2011

Salmonella and *E. coli*: 30 minute doubling time at 80°F

- 8 am — 1 cell
- 9 am — 4 cells
- 10 am — 16 cells
- 11 am — 64 cells
- 12 pm — 256 cells
- 1 pm — 1024 cells
- 2 pm — 4096 cells
- 3 pm — 16,384 cells
- 4 pm — 65,536 cells
- 5 pm — 262,144 cells
- 6 pm — 1,048,576 cells

Fast growth rate

Medium growth rate

Why is produce getting so much attention now?

- Produce-related outbreaks in mid-'90s
- 1998: FDA created voluntary guidelines "Good Agricultural Practices" (GAPS)
- Multi-state outbreaks associated with spinach and tomatoes (2006), cantaloupes (2008), hot peppers? (2009)
- 2010: Federal legislation passed by Congress

Food Safety Modernization Act (FSMA)

- Passed by Congress in 2010
- Applies to fruits, vegetables, & processed food
- Does not apply to meat, poultry or dairy

- FSMA draft regulations were due out in January 2012, but could now be delayed until after November elections?

Food Safety Modernization Act

Three key areas of FSMA:

1. **Practices for fruit and vegetable production & harvest**
2. **Food facility registration (*more to come)***
3. **Traceability & Recordkeeping (*more to come*)**

FSMA Small Farm Exemption

- FSMA exempts “small farmers” from food safety regulations, if they meet ALL of the following criteria:
  - 50% direct marketed to consumers, stores and restaurants
  - Direct market in the same state or within 275 miles
  - Total farm sales less than $500,000
  - Name, address and phone # provided to customer

Food

Resources for You

- **FDA Implementation Timeline**
- **Recalls, Market Withdrawals, & Safety Alerts**

The New FDA Food Safety Modernization Act (FSMA)

The FDA Food Safety Modernization Act (FSMA), the most sweeping reform of our food safety laws in more than 70 years, was signed into law by President Obama on January 4, 2011. It aims to ensure the U.S. food supply is safe by shifting the focus from responding to contamination to preventing it.

Get FSMA Updates by E-mail

Focus on Sprout Producers

Through the new Sprouts Safety Alliance, FDA is helping producers identify and implement best practices in the safe production of sprouts.
More >

1 of 3

What's New | How to Participate | Main Topics

- Role of the Food Safety Modernization Act in Ensuring the Safety of Pet Food
  Michael R. Taylor, Deputy Commissioner for Foods
  Pet Food Forum, Schaumburg, IL
  April 4, 2012
- FDA Progress Report on Implementing the Food Safety Modernization Act: January - March 2012
- Ensuring Produce Safety in a Global Food System
  Michael R. Taylor, Deputy Commissioner for Foods
  America Trades Produce, Tubac, AZ
  March 22, 2012
- Interim Final Rule: Establishment, Maintenance, and Availability of Records: Amendment to Record
- Draft Guidance for Industry: FDA Records Access Authority Under Sections 414 and 704 of the Federal Food, Drug, & Cosmetic Act
- More on What's New...

Local & State Food Safety Requirements

BUT: Farms exempt from FSMA must meet local and state requirements:

- **County Environmental Health Department**
- **CDFA**
- **CA Department of Public Health**

Environmental Health Department

cdfa
CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

California Department of Public Health CDPH

Industry Food Safety Requirements

- Many customers require that produce suppliers have 3rd party food safety certification (CDFA, Primus Labs, NSF Agriculture)

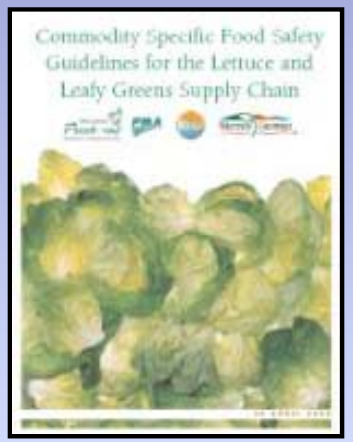
- Cancelled policies or increased premiums for some farms that direct-market leafy greens

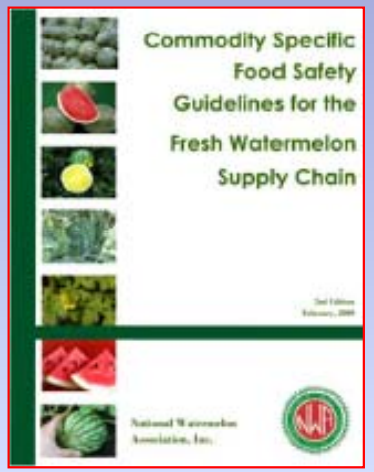
Probable Future Requirements

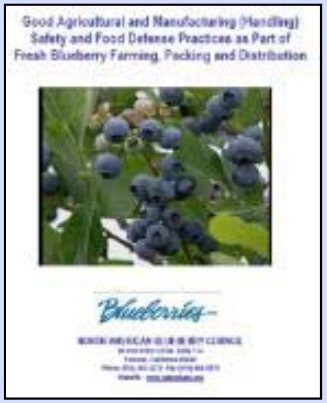
- Schools
- Farmers Markets
- Donations to Food Banks

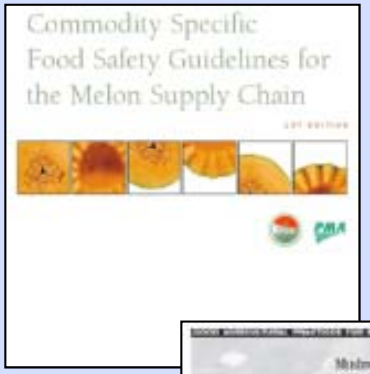
Commodity-Specific GAPs and Food Safety Audit Checklists

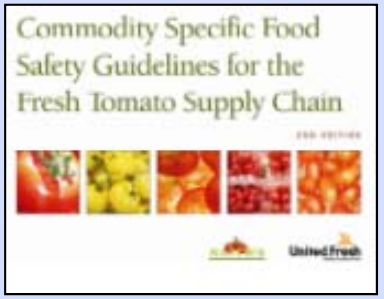
- Melon
- Tomato
- Stone fruit
- Mushroom
- Lettuce & Leafy Greens
- Culinary Herbs
- Green Onions
- Sprouts
- Almond
- Citrus
- Strawberry
- Watermelon
- Blueberries
- Asparagus

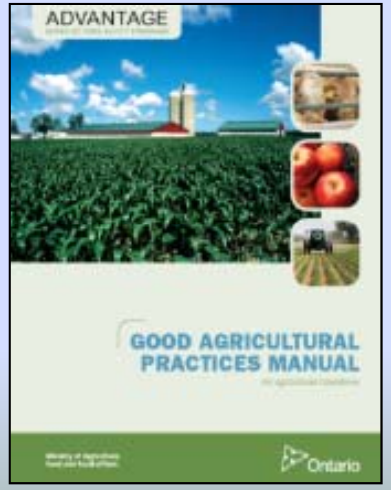












How much should I do?

- Use common sense “good agricultural practices”
- Develop a food safety plan for your farm
- Conduct a self audit (Self Certification)
- Become certified by a 3rd-party auditing company

Key Areas Food Safety

Water: Pre- & Post-harvest

Waste: Manure & Compost

Wildlife: Intrusion & Fecal

Workers: Hygiene & Training

- Record-keeping
- Traceability

Previous Land Use?

- Write down what the land has been used for previously; and if manures were applied
  - crop land, fallow?
  - dairy, livestock, poultry farms?
- Discuss what you have done to resolve possible problem
  - e.g., had the soil tested for bacteria
- Discuss what you did to reduce the risk if there is possible flooding or runoff from neighbor's horse pasture, hilly ground, etc.
  - e.g. dug a trench or put up a berm of soil on 2 sides of my farm


Horses adjacent to a farm
Make a trench or berm

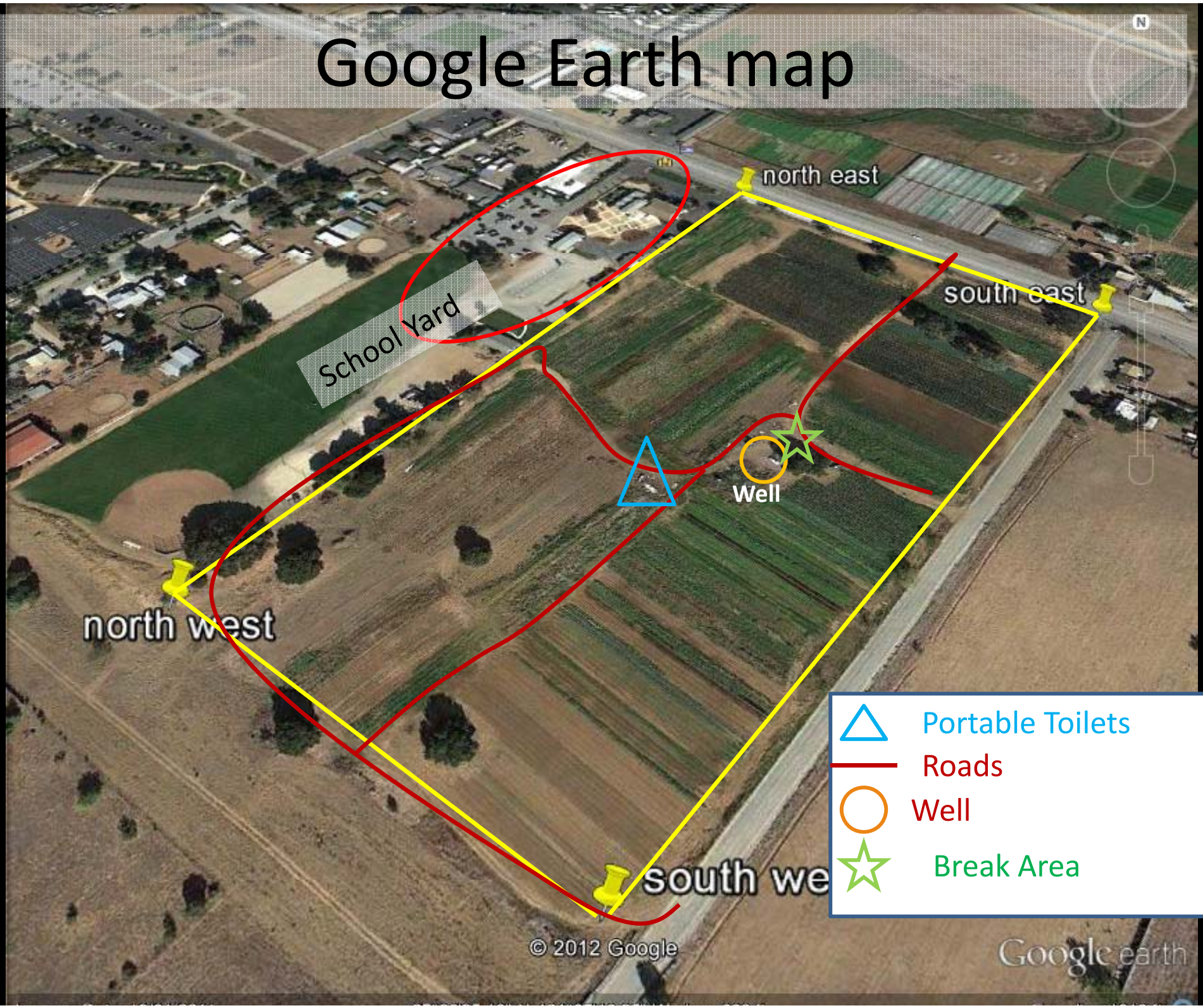
Mapping a farm

- Field map: Record activities within & adjacent to your property.
- Map should include:
  - Crops
  - Roads
  - Wells and other water sources
  - Lakes, rivers, ponds, reservoirs
  - Ditches
  - Buildings, including semi-permanent portable toilets and break areas
  - Neighboring property features

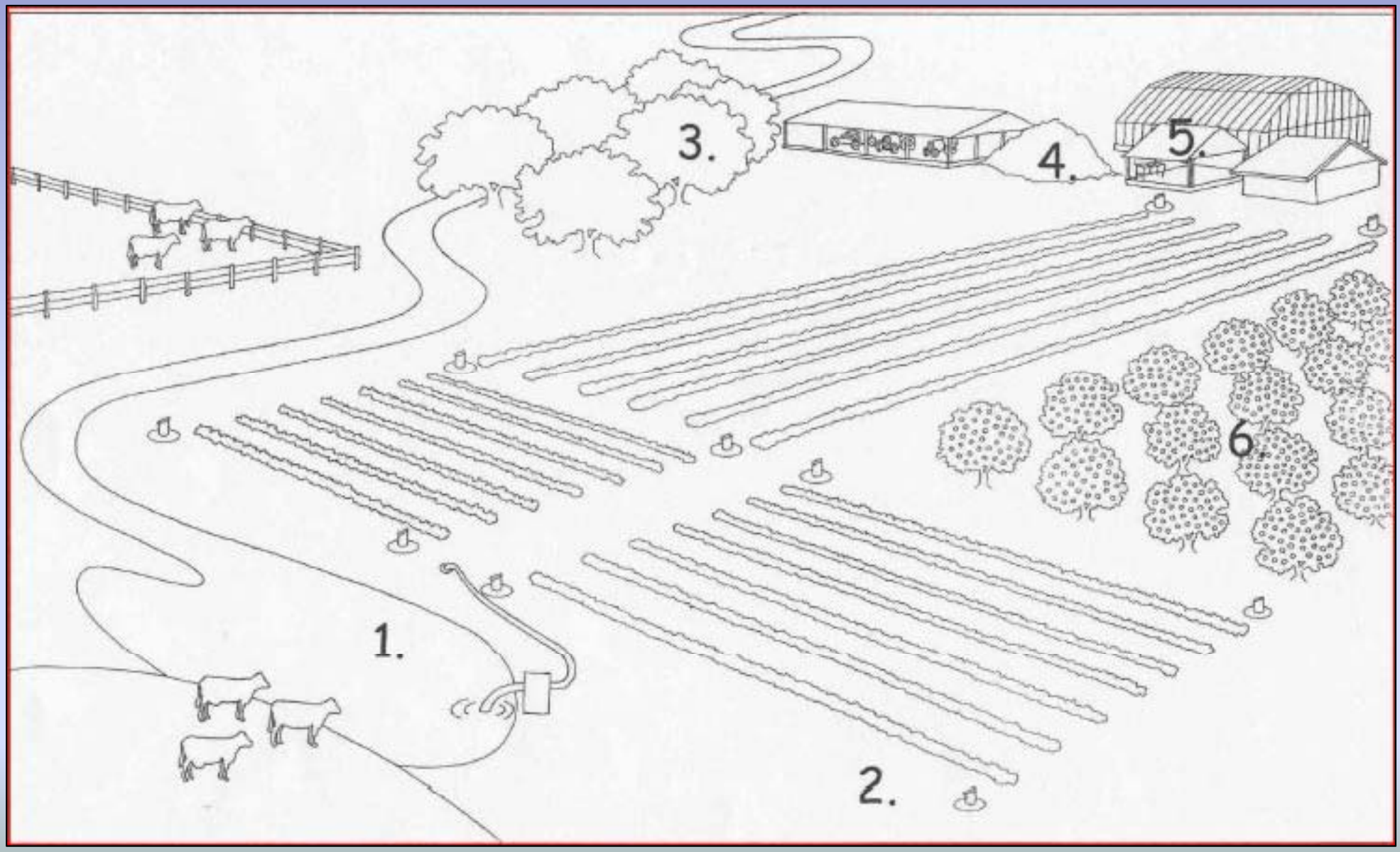
Creating a map…

- 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

Google Earth map



Another map



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

Water, Waste, Wildlife, Workers

Agricultural Water

* Surface sources – canals, rivers, streams
* Reservoirs – open or capped
* Wells
* Municipal sources

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

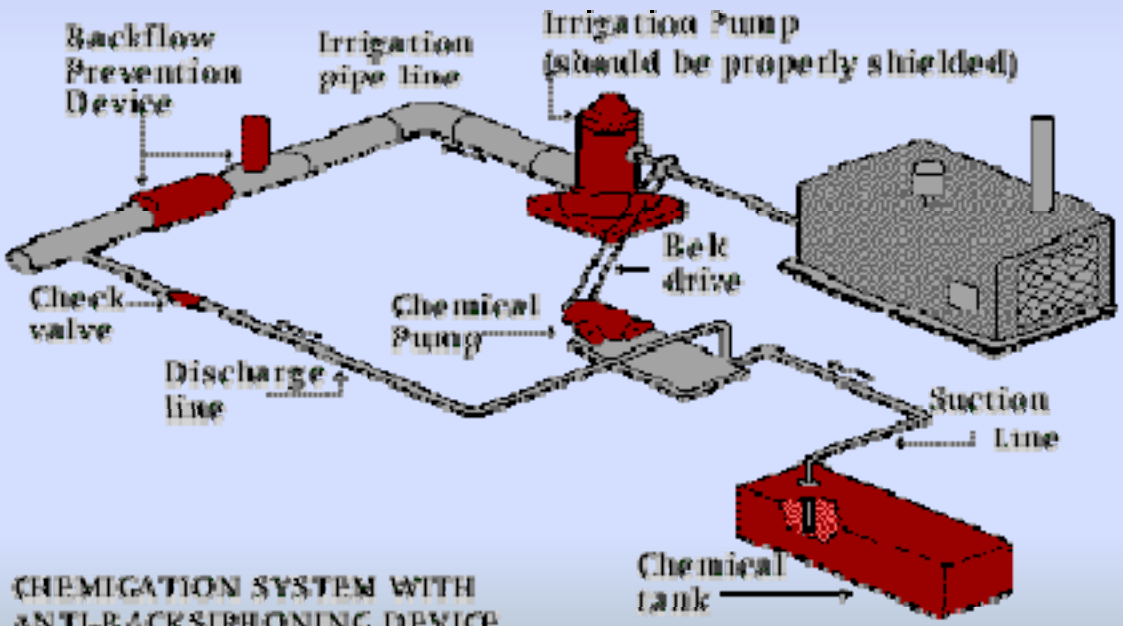
Source: NRCS

Irrigation Source ?

Case: Fillmore, CA.

Peppers initially irrigated with well water, then toward harvest, river water was delivered, contaminated with bacteria

Ensure that wells are designed and maintained in a manner that prevents contamination



CHEMIGATION SYSTEM WITH ANTI-BACKSIPHONING DEVICE

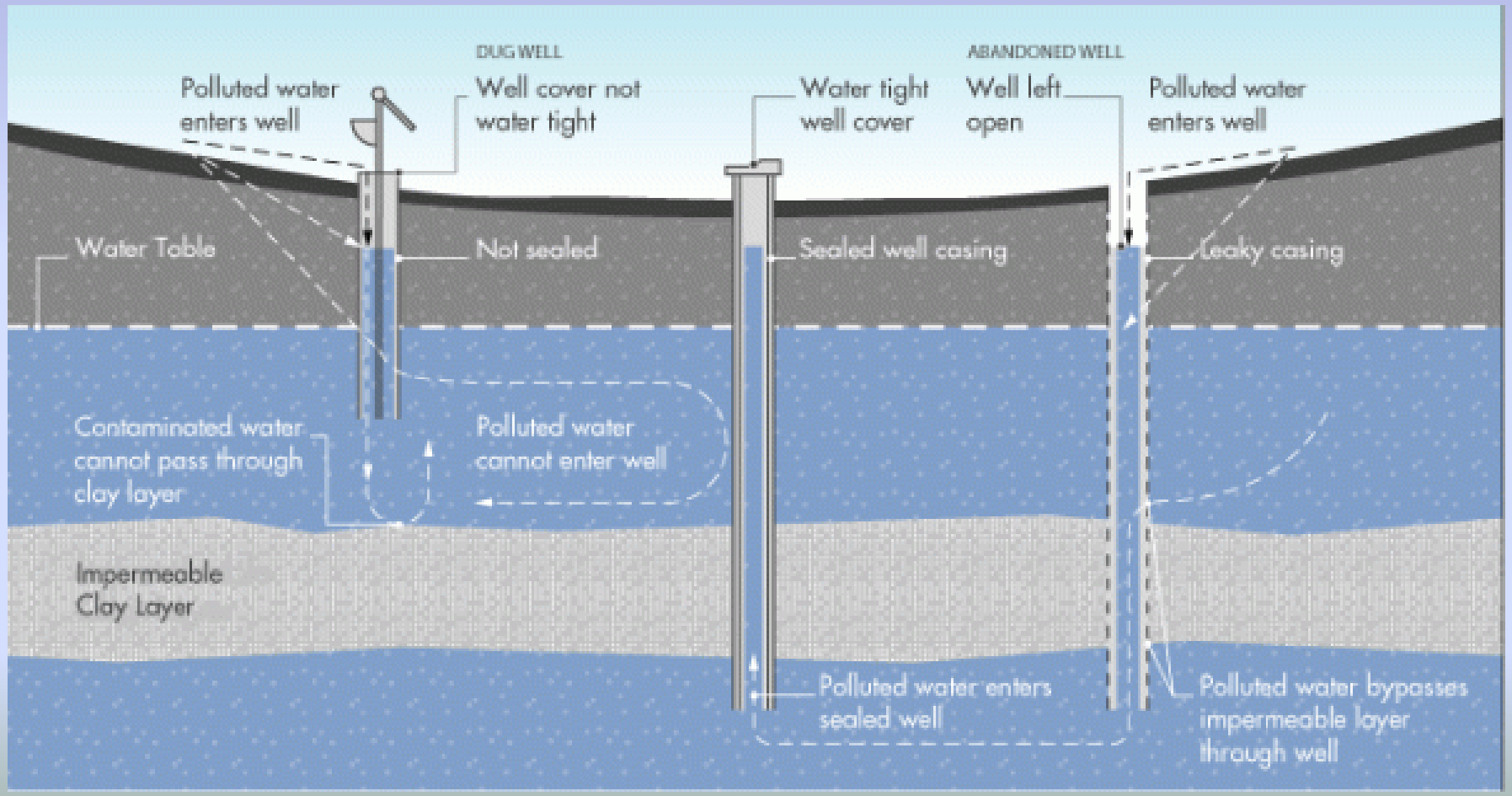
Animal burrow at well head

Potential Fertilizer Contamination

Potential Fertilizer Contamination

Ground water may be contaminated by a variety of biological and chemical hazards

*Bacteria and viruses *Domestic waste *Nitrate nitrogen
*Synthetic organic chemicals *Heavy metals *Petroleum residues
*Combustion products from roadways

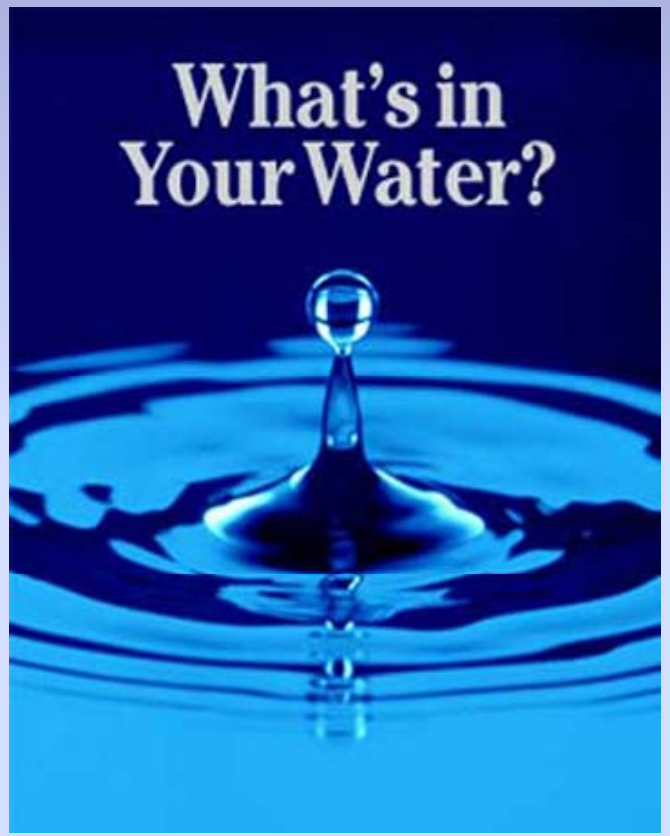


Source: Kawartha Conservation

Microbiological testing of water

List of labs licensed by the state is available from State Dept of Public Health

Keep records in case of a microbiological outbreak investigation



Irrigation Method?

Drip—Spray—Furrow—Flood

Water with less chance to contact plants has fewer problems of contamination

Spray Water Quality

- Make sure spray water quality is safe
- Keep spray & water quality records
- Low water volumes reduce risk

How often should I test water?

If water source is:		Then testing frequency is:
Closed source – well	⟹	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

Bacteriological Water Analysis

DELLAVALLE® Laboratory, Inc.
Chemists and Consultants

1910 W. McKinley, Suite 110, Fresno, CA 93728
FAX (559) 268-8174 - (800) 228-9896 - (559) 233-6129

Univ of Calif Coop Ext %Richard Molinar
1720 S. Maple
Fresno CA 93702
2652
21

Lab No. 157969
Sample Date 6/15/2011
Sample Time 13:30
Sampler
Submitted Date 6/15/2011
Submitted by Michael Yang
Reported Date 6/16/2011
Location/Project [redacted]
Copy To
Fax (559) 456-7575
email rhmolinar@ucdavis.edu

Material Submitted:

		Date Started	Time Started	Rec'd Temp °C	Total MPN Coliform per 100 ml	MPN E-Coli per 100 ml	Residual Chlorine mg/L
RL--->					< 1	< 1	
SM--->					9223	9223	Field test
Analysis Date:		6/16/2011	6/16/2011	6/16/2011	6/16/2011	6/16/2011	
001	McCall & Kings Canyon	6/15/2011	15:36	28.4	83.6	<1	

Coliform is a generalized category of bacteria that is a moderate health risk. Warnings are marked in **Orange Color.**
E-Coli is a specific strain of bacteria and is a severe health risk. Warnings are marked with **Red Color**.

When coliform bacteria is detected a full chlorination of the drinking water system is required.

If E-Coli bacteria is detected, all human consumption should stop immediately (unless boiled). An immediate chlorination of the drinking water system must occur with retesting prior to allowing human consumption.

MPN _ Most Probable Number. This is a statistical number to represent the number of bacterial colonies found in a random sample of this water. The higher the number, the greater the amount of bacteria in the sample.

MPN Coliform Description of terms: No Bacterial Contamination Found = <1
Bacterial Contamination Detected = greater than 1

BSK Associates
Engineers & Laboratories

Certificate of Analysis

[redacted]
P.O. Box 828
Selma, CA 93662

Report Issue Date: 03/21/2012 14:39
Received Date: 03/13/2012
Received Time: 10:42

Lab Sample ID: A2C0852-01
Sample Date: 03/13/2012 10:42
Sample Type: Routine
Sample Control Qualifiers: SC02
Sampled by: [redacted]
Matrix: Water

Sample Description: Water Canal MID

Microbiology

Analyte	Method	Result	RL	Units	Batch	Prepared	Qual
E.Coli by 1x10 MTF							
*E. Coli	SM 9221 B/F	>23	1.1	MPN/100 mL	A202592	03/13/12 15:18	

Water, Waste, Wildlife, Workers

The major source of microbial contamination is associated with human or animal feces

Growers need to identify obvious sources of fecal matter that could be a source of contamination

Potential Sources of Contamination

- Untreated or improperly treated manure
- Manure composting or storage areas
- Livestock or poultry operations

Potential Sources of Contamination

Nearby municipal wastewater or biosolids storage, treatment or disposal areas

Potential Sources of Contamination

High concentration of wildlife

Even Domestic Pets

2006 outbreak of E. coli O157:H7 in spinach

Livestock nearby = runoff

Pasture runoff after a rain to ???

Compost Handling and Application

- Away from production/handling areas
- Barriers or physical containment
- Apply mature, properly made compost
- Maximize time between application and harvest
  - >45 days prior to harvest for composted manure
  - 120 days prior to harvest for raw, non-composted manure

Compost Application

Livestock in the field

Remove animals at least 120 days prior to harvest

What can Farmers Do?

Prevention- Avoid:

- animal facilities (within ¼ mile)
- where birds perch over the crop
- wildlife habitat

What can Farmers Do?

Monitoring: monitor fields for wildlife intrusion and define a no-harvest zone if fecal matter present

What can Farmers Do?

Exclusion: If problem persists, fences, netting or other physical barriers can be used to exclude wildlife

What can Farmers Do?

Management:

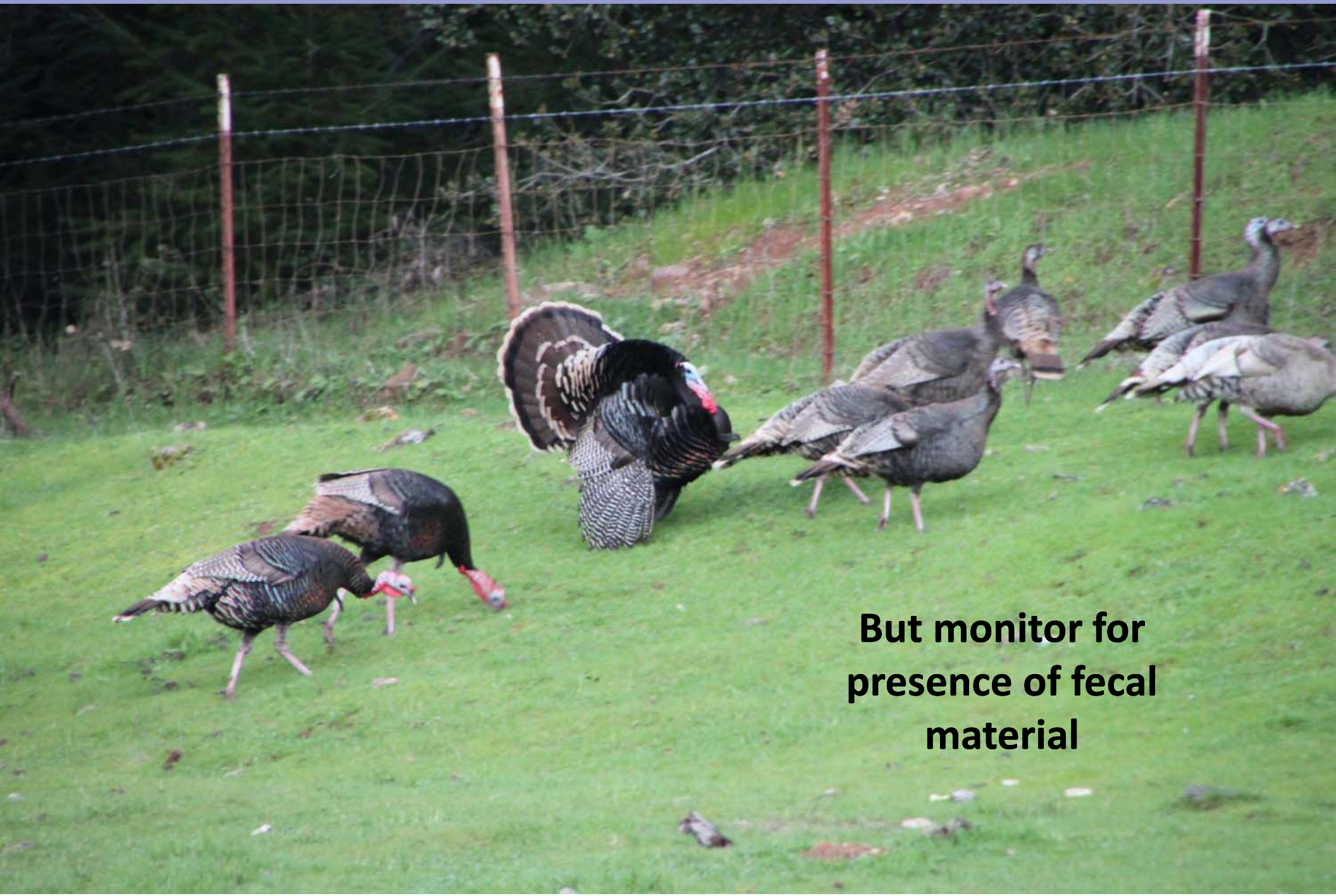
- Deterrents
- Trapping
- Baits

see UC IPM guidelines (www.ipm.ucdavis.edu)

What can Farmers Do?

Removal: If possible and allowed, hunt or physically remove wildlife

Some things you can't control



Water, Waste, Wildlife, Workers

Worker health and hygiene

How do workers pose a risk?

- Human bodies carry a variety of bacteria and viruses, greatest risk is human feces
- Even if somebody is not sick, they may still be able to contaminate produce and others
- Workers often must have close contact with produce as part of their job

Some outbreaks associated with infected workers

Date	Produce	Pathogen	# of cases	Produce origin
1987	raspberries	Hepatitus A virus	92	United Kingdom
1990	strawberries	Hepatitus A virus	53	United States
1994	green onions	Shigella	72	CA
1996	leaf lettuce	E. coli 0157:H7	49	United States
1997	strawberries	Hepatitus A virus	250	CA
1997	green onions	Cryptospordium	55	United States
1997	basil	Cyclospora	341	United States
1998	green onions	Hepatitus A virus	43	United States/CA
1999	parsley	Shigella	486	United States
2003	parsley	enterohemorrhagic E. coli	77	United States

Worker Illness

- 93% of outbreaks related to food handlers involved sick workers
- Sick workers must tell supervisor; supervisor may give alternative work or ask them to stay home
    - Vomiting
    - Diarrhea
    - Jaundice (yellow skin or eyes)
    - Fever
    - Sore throat

First aid/ open cuts

Train workers on:

- First aid kit location
- First aid for cuts and other injuries
- Wounds must be properly covered or worker should be reassigned to another job
- Throw away produce that could have been contaminated by blood or other body fluids

Follow OSHA regulations regarding toilet facilities

Provide toilets: 1-male and 1-female for every 20 employees

For less than 5 employees, 1 lockable toilet is OK

Supplied with toilet paper

Cleaning dates posted

Toilet must be located within ¼ mile or no more than of 5 minutes walk from the work site

Don’t allow toilets to become a source of contamination

- They must be cleaned on a regular schedule
- If you have toilet cleaning equipment, then it must be labeled and stored separately
- Have a plan in the event of a leak or spill

Nice and Clean at all times


TAVO'S
TOILET SERVICE
559-528-6004
TAVO'S
TOILET SERVICE
559-528-6004

Handwashing facilities

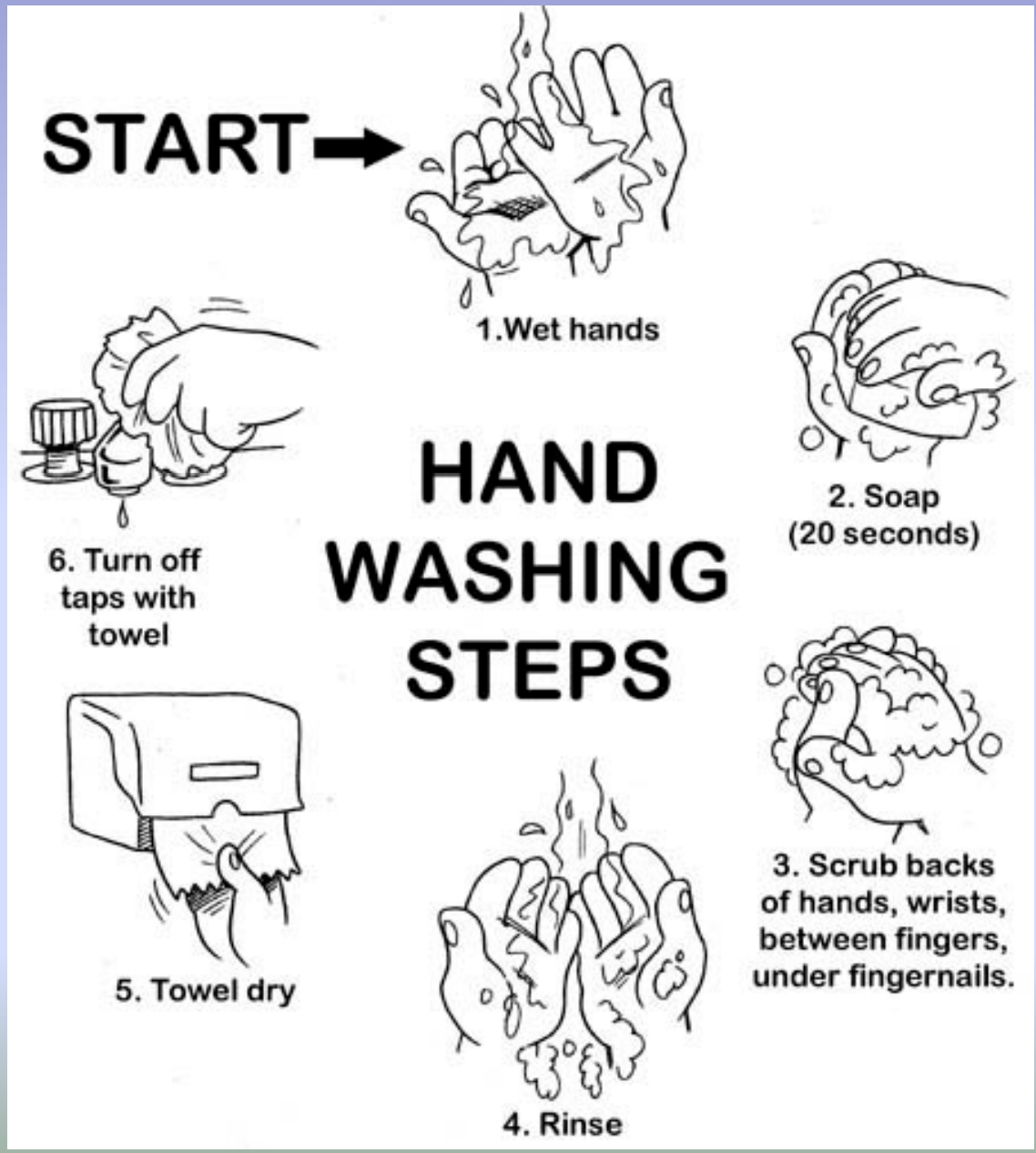
- Near toilet facilities
- Potable water only
- Liquid soap dispensers, Single-use paper
- Containers need to be emptied, cleaned and sanitized regularly
- Collection of drain water
- Trash can with lid

Hand washing policy

- Before starting work
- After breaks
- After using toilet
- After handling garbage
- After working with soil or rotten produce
- After sneezing or coughing on hands

Proper Handwashing Technique

Sanitizers may be used in addition, but not instead of soap and water



Proper use of gloves

- Gloves are not a substitute for proper handwashing
- Wash hands before putting on gloves
- Change gloves anytime they might have gotten dirty (i.e. anytime you would wash your hands)
- For reusable gloves, clean/sanitized pair should be issued to employee as needed

Break areas

- Designated area away from where produce is being handled
- Handwashing facilities close by
- Marked on farm map
- Cleaned regularly so rodents do not become attracted to the area
- No smoking, chewing tobacco or gum, or eating outside break area

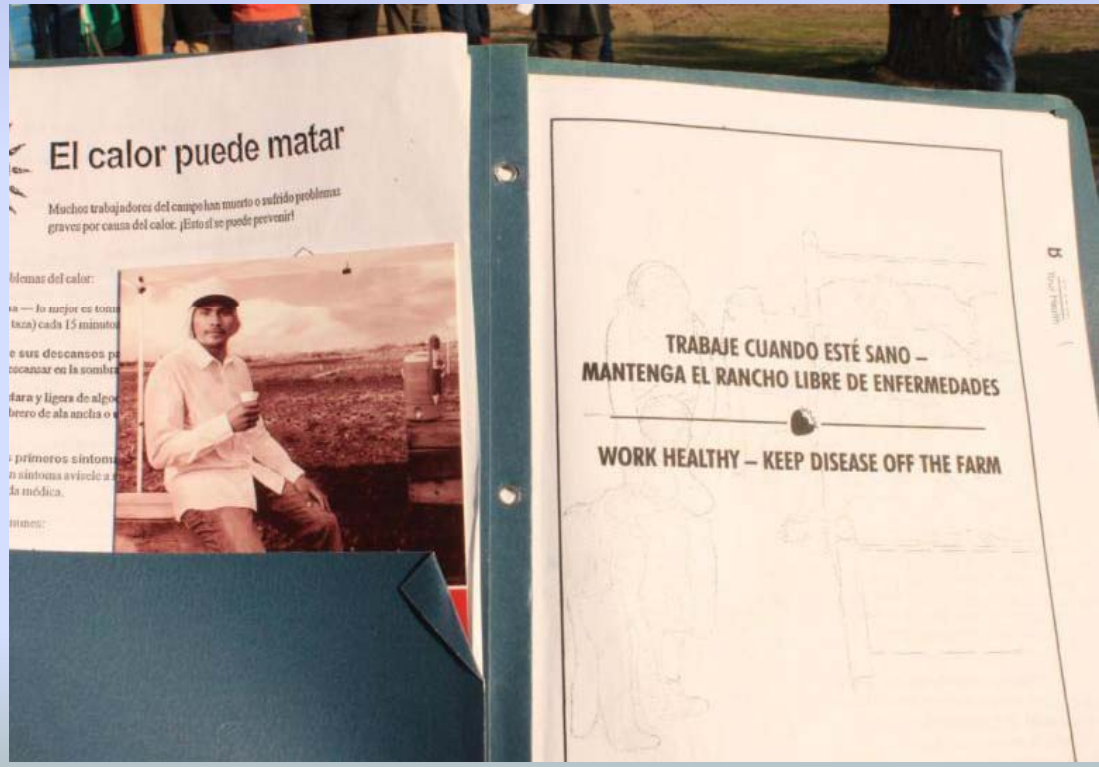

AREA PARA COMER

Other worker and hygiene issues

- Have a policy which limits jewelry
- No false nails, nail polish, keep pockets empty above the waist
- Request nails be trimmed short, wear clean clothes, bathe daily
- Drinking water containers: empty, clean and sanitize daily

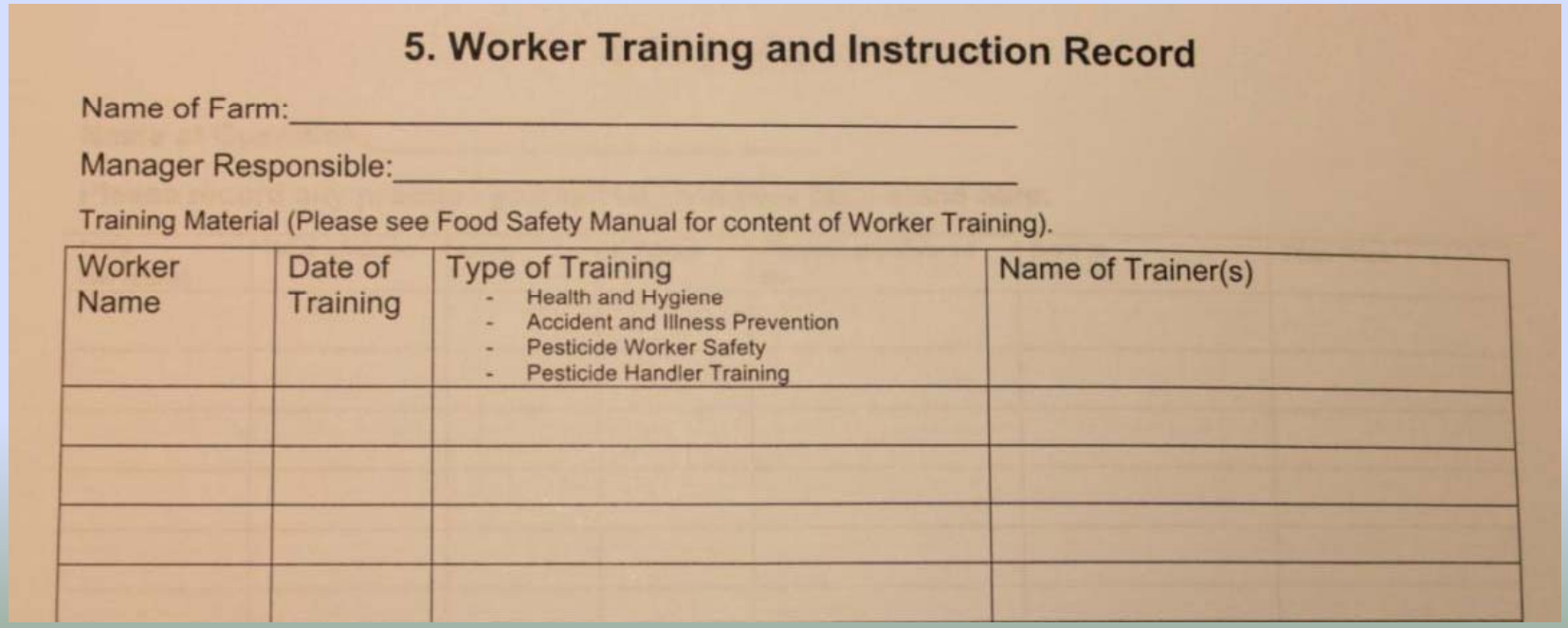
Worker training

- Train everyone!
- Training materials (videos, posters – see resource list)
- Topics:
  - Health and hygiene
  - Illness and accidents
  - Pesticide safety



Training and recordkeeping

- Documentation of worker trainings
- Record maintenance of toilet and handwashing facilities
- Records of illness and injuries



5. Worker Training and Instruction Record

Name of Farm:_____

Manager Responsible:_____

Training Material (Please see Food Safety Manual for content of Worker Training).

Worker Name	Date of Training	Type of Training - Health and Hygiene - Accident and Illness Prevention - Pesticide Worker Safety - Pesticide Handler Training	Name of Trainer(s)

Top things to reduce risk

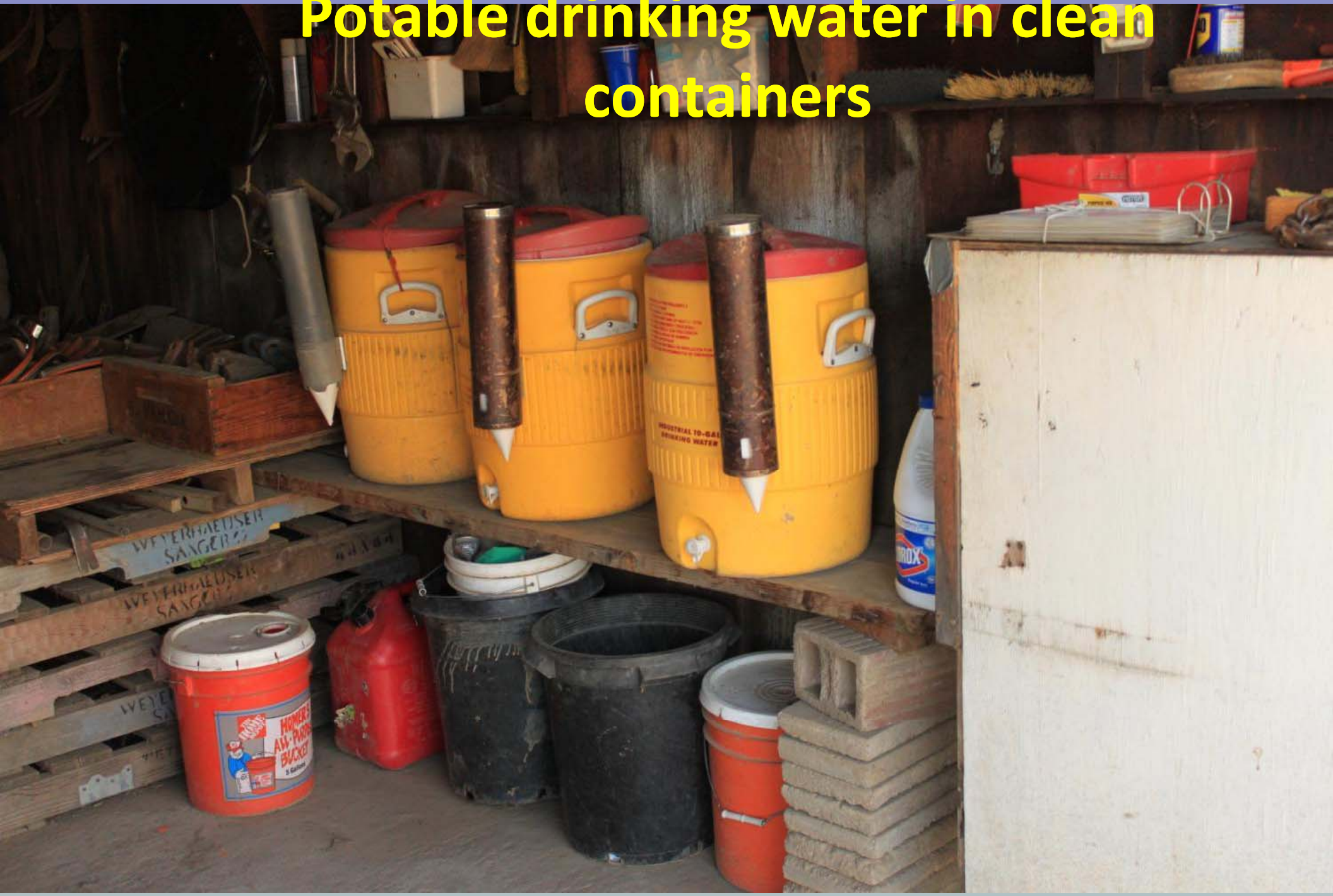
- Keep toilet and handwashing facilities clean and easily accessible
- Training and signs showing proper procedures
- Do not allow sick employees to handle produce

Field Harvesting and Transportation & Post Harvest Water Use

Worker health & hygiene

During harvest, worker health and hygiene policies should be strictly enforced

Potable drinking water in clean containers



During Harvest

- Keep equipment clean and free from oil, grease, broken glass or other contamination
- All contaminated produce is thrown away
- Inspect field and remove glass, metal, dead animals or any other toxic items

Cleaning and sanitizing harvest bins

- See handout for sanitizing procedure

Clean Field Harvesting Equipment
with 1 Tbs. chlorine bleach(5.25%)/gallon

- **Step 1: Place harvest containers next to sanitized surface (plastic) that has been pre-rinsed, scrubbed with detergent, rinsed & sanitized.**
- **Step 2: All buckets are pre-rinsed to remove visible soil.**
- **Step 3: Buckets will be scrubbed with detergent and rinsed.**
- **Step 4: Scrub buckets and dip in bleach then air-dried and stack.**
- **Step 5: Check water with chlorine test strips for proper strength.**

- **Dispose of wastewater daily away from production areas**
- **All cleaning tools labeled "Harvest Equipment Only"**
- **Workers must wear water proof aprons, rubber gloves, & goggles**
- **Maintain a written Farm Cleaning Record**

Wash Water

Washing Produce

- Water must be potable
- Wash tanks, tubs and food contact surfaces are cleaned and sanitized regularly
- Chlorine will not sterilize produce

Washing Produce

with chlorine solution

½ tsp. bleach (5.25%) in 6 gallons of water = 5 ppm

Use chlorine test strips to determine chlorine content

- Start with potable water - pH of between 6 and 7.5
- Use pH test strips to determine pH
- Change water in the dump tanks at least daily
- Change water when chlorine content < 5ppm
- Rinse produce with potable water prior to packaging

Produce Sanitizers

Trevor Suslow
Department of Plant Sciences
Center for Produce Safety Advisory Board & Technical Committee
tvsuslow@ucdavis.edu 530-754-8313

Use of Chlorine on Organic Produce

- Organic growers, shippers, and processors may use chlorine within specified limits
- All forms of chlorine are restricted materials as defined by existing organic standards
- California Certified Organic Farmers (CCOF) recently modified the threshold to permit 10 ppm residual chlorine measured downstream of the wash step
- Growers certified by other agencies should check with their certifying agent

PEROXYACETIC ACID

H_2O_2 + CH_2COOH ⇌ H_3COOH

Hydrogen Peroxide	Acetic Acid	Peroxyacetic Acid

- Break-down products: acetic acid, O_2, CO_2, H_20

- Permitted dosage (FDA):
  - Cleaning surfaces 85 – 300 ppm
  - Contact with food 85 ppm maximum
    - Typical rates 30-35 ppm

Peroxyacetic Acid (PAA) - Advantages

- Less impacted by organic matter and soil
- Low foaming
- Very good biofilm penetration
- Very good on molds and spores

Peroxyacetic Acid - Disadvantages

- More expensive than hypochlorite at effective dose
- Corrosive to soft metals and skin
- Strong, pungent odor of concentrate and dilute forms (worker discomfort & safety)
- Varied activity against fungi
- Prolonged exposure may cause product damage
  - build up of acetic acid in water
  - may cause sliming, browning, translucency
- Need to monitor water turn-over closely

Transporting Produce

- Vehicles have not carried sewage, manure or hazardous materials
- Keep vehicles clean
- Keep pallets, scales, carts, & forklifts clean

Standard pack = new box

Traceability

Why is Traceability important?

- Pinpoint the source of contamination
- Quickly remove from the food chain

USDA--GAPs Traceability Requirements

- G-1 Documented traceability program has been established
- G-2 Operation has performed a “mock recall” that was proven to be effective
- 1-26 Each production field is identified to enable traceability in event of a recall
- 2-21 Product moving out of the field is uniquely identified to enable traceability in event of recall

How to ensure traceability

- **When direct marketing, traceability requires:**
  - **1 link back (*suppliers*)**
  - **1 link forward (*customers*)**
- **Record harvest date on every harvest bin as crop is harvested**
- **If multiple fields of same crop, also record field # & harvest crew**

Examples of companies providing tracking/traceability services and supplies

AGRIAN
Ag Data from Field to Fork

ATS
Advanced Traceability Solutions

ScoringAg
Point-to-Point Traceback™ — Site-Specific Recordkeeping™

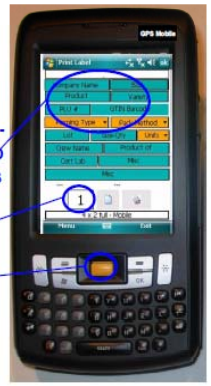
Automated Data Collection & Tracking

GPS Mobile Printing System

Harvest

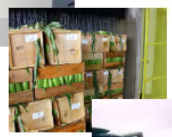
On Demand Labeling of Items & Containers in Exact Location

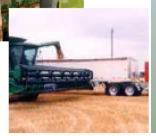
Without Electricity or Cell tower or Network Available!!



4) Poly Label with 2D barcode is printed in Seconds

5) Affix Label to container





* Easily & Quickly enter info – ANYWHERE in world
* SmartPDA Automatically prints very accurate GPS coordinates, date and time plus user info.
* Durable poly label is easy to read & has *UNIQUE* SN
* Every Container is NOW uniquely marked for traceback
* Special adhesive enables label to stick to any container
* Multiple counterfeit prevention functions

Traceability & Your Farm Map

- Have map of farm showing fields & crops
- Keep map updated
- Ensure that all farm personnel (particularly harvest crews) know codes for different fields
- Field number should be recorded on each harvest bin

Traceability for Farmers Markets

- When selling at farmers market, record:
  - harvest date (& field number, if harvest crop from 1+ fields)
  - crops sold
  - market name & date

- Prominent stall signage
- Business cards or stickers?
- Bags with name & contact information?

Traceability for a CSA

- CSA customers have your contact information
- Crops from multiple fields: record harvest date & field number on box, & keep a record by CSA delivery date
- Sourcing from other farms: record source farm by crop and CSA delivery date

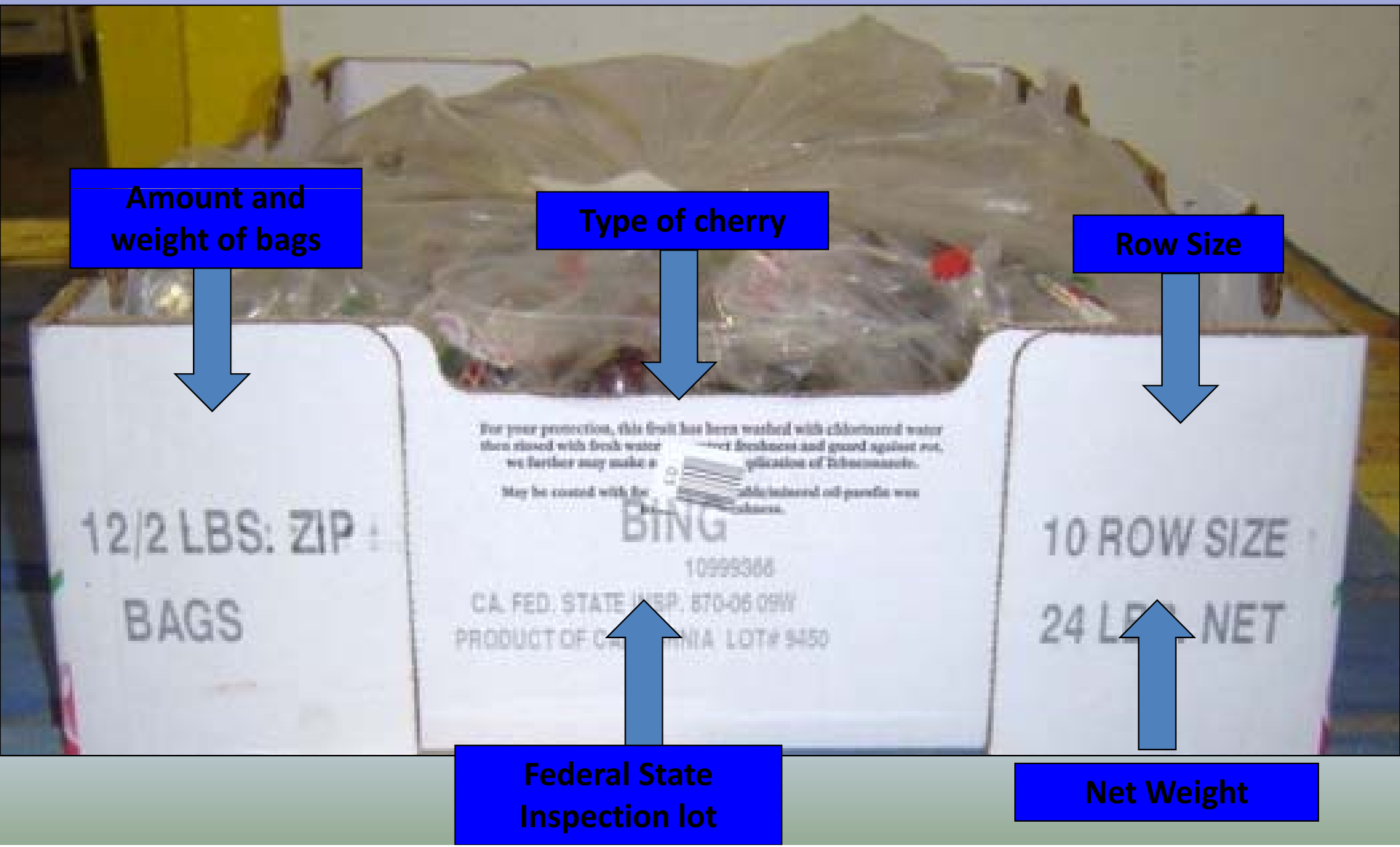
Traceability for Farm stands

- Put your name & contact information on receipt
- Record harvest date & field# for crop
- Sourced products: record date & source farm for each crop sold

Traceability For Wholesale

- In California, produce sold through wholesale channels must have:
  - standard container for particular crop
  - farm name & location (printed or sticker)
  - date stamp (actual date or Julian date)
  - required crop name, pack, grade & size
  - can be hand written, printed on stickers, or stamped on box w/hand-held labeling gun

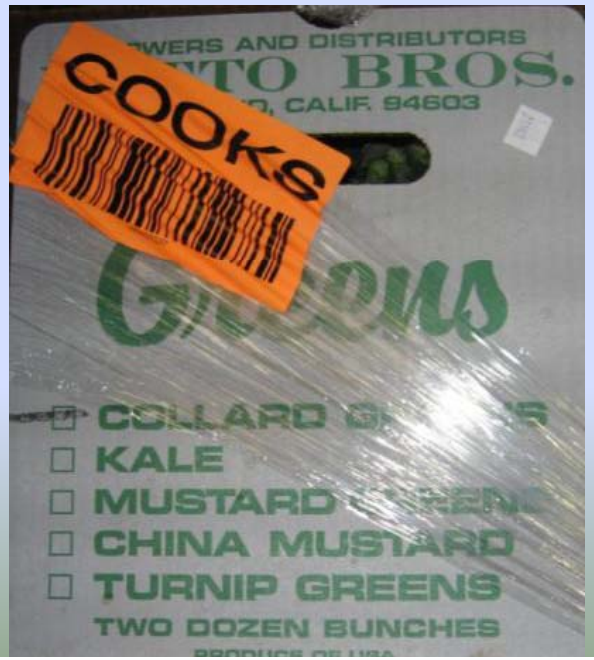
12/2 Bags


Amount and weight of bags
Type of cherry
Row Size
12/2 LBS: ZIP
BAGS
BING
10 ROW SIZE
Federal State Inspection lot
Net Weight

Traceability For Wholesale

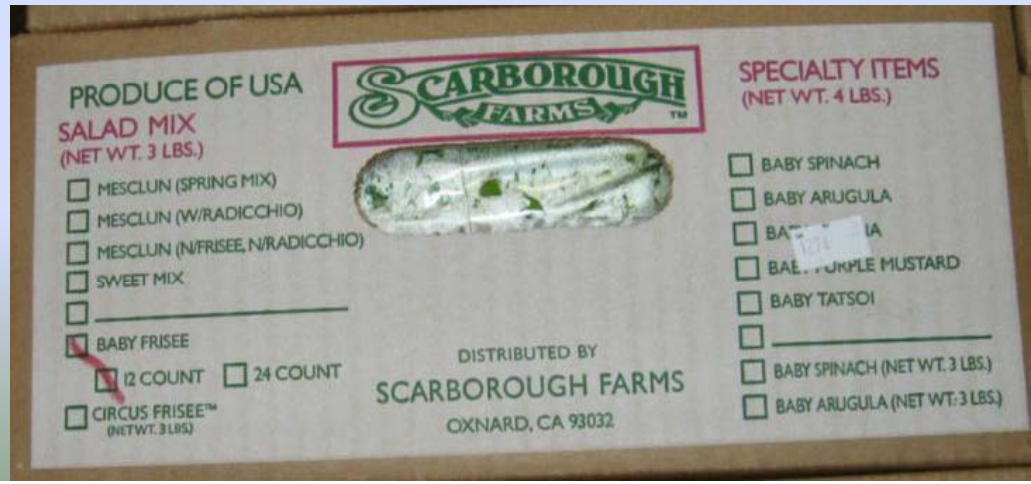
- Placing a label on wrapped pallet is not sufficient

- Use hand-held labeling gun to code each box:
  e.g.,lot code – 020-16756170 indicates:
  - 020 = box number
  - 167 = (date harvested) Julian calendar date (such as 167 for June 13) or use the calendar date 613--reserves the first 3 digits for dates
  - 5 = grower
  - 6 = field picked or picker
  - 170 = packing date

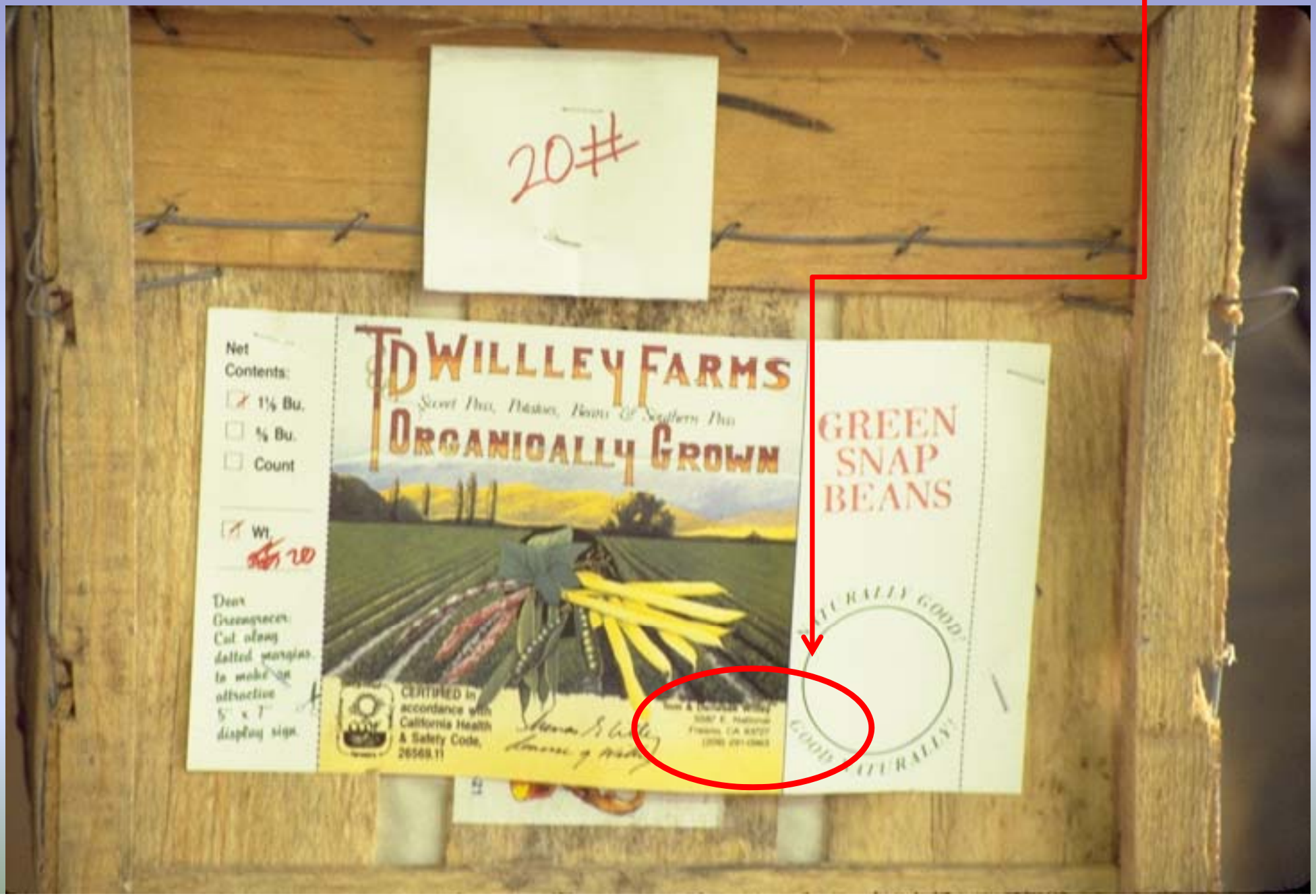


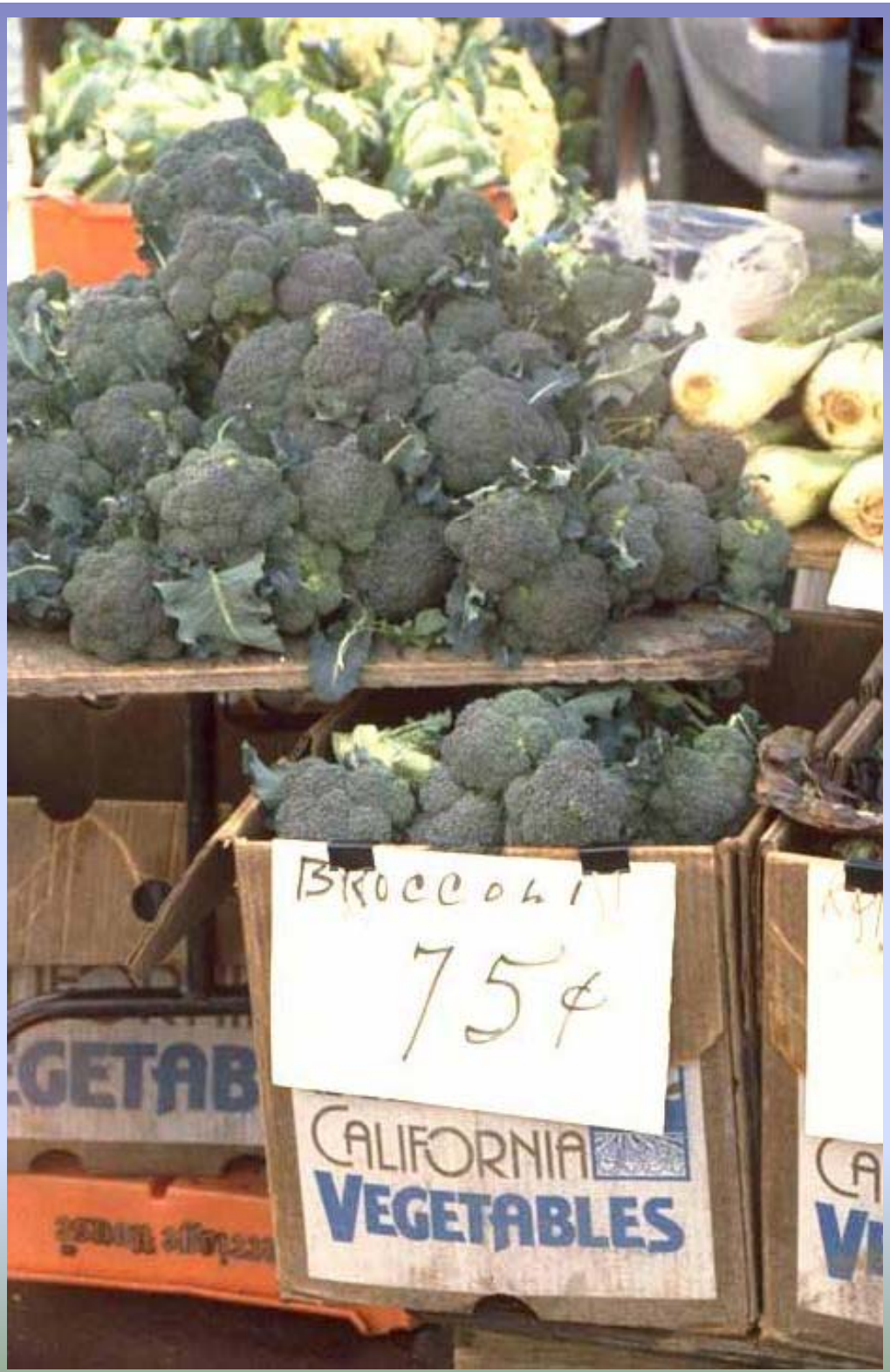
Traceability For Wholesale

- At end of each packing day, record beginning & ending box numbers in book
- Code for these numbers needs to be recorded once & filed
- When you ship products, keep log by box number of which box was shipped where, with shipping date



Name – Address - Phone





Can this be traced back to a specific farm, specific field, and specific date?

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

UC CE University of California Cooperative Extension

Vegetable Crops in San Joaquin County

Vegetable Crops In San Joaquin County

Growers in San Joaquin County produce vegetables on roughly 75,000 acres at a farm-gate value of $368 million in 2009. Major vegetable crops, ranked by gross value in 2009, include:

- Processing tomatoes
- Fresh market tomatoes
- Asparagus
- Potatoes
- Bell Peppers
- Sweet Corn
- Pumpkins
- Watermelons
- Onions
- Cucumbers

Tomato Field in flower

We conduct research trials in commercial fields with local grower cooperators. Our goals are to improve profitability and solve pest management (weed, disease, nematode, and insect pests) problems affecting local vegetable producers

Calendar

Event Name	Date
Food Safety for Small-scale Farms	5/3/2012

Contact Info

Brenna Aegerter, Ph. D.
Vegetable Crops Advisor

209-953-6114

bjaegerter@ucdavis.edu

Sign-up for future mailings

http://ucanr.org/sites/veg_crop_sjc/Presentations/

4 levels of Safety Plan

1. Use common sense “good agricultural practices”
2. Develop a food safety plan for your farm
3. Conduct a self audit (Self Certification)
4. **Become certified by a 3rd-party**

Good Agricultural Practices **(GAP's)**

Companies and Agencies that will do 3rd Party Audits

- ***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***