Cleaning, Sanitizing, & Disinfecting on the farm: COVID-19 and beyond

Lisa McKeag
UMass Extension Vegetable Program
lmckeag@umass.edu

UMass Extension

Outline

- Considering COVID
- Cleaning, Sanitizing and Disinfecting basics
- When to do what
- What products to use
- How to use (safely)

COVID-19

- Lots of questions about cleaning and sanitizing to comply with coronavirus guidance
- Government guidance about cleaning and sanitizing in workplaces to control COVID-19
  - Latest MDAR Guidance on Labor during COVID-19 includes section on Cleaning and Sanitizing
- Revealing spectrum of current sanitation practices
- Good Agricultural Practices are important for managing food safety risks and can help reduce risks related to COVID-19
- Important to establish good practices for COVID and beyond

COVID-19

- No evidence that transmission occurs through food or food packaging
- Spread mainly person-to-person, through respiratory droplets
  - Social distancing, face coverings, hand washing
- Possible transmission by touching an infected surface and then touching your mouth, nose, or possibly eyes
- Not the main source of transmission – surface transmission has not been documented
- Relatively easy to kill – enveloped virus
- Can exacerbate food safety risks. Adds …
  - Stress!
  - New protocols
  - Possible labor shortages
  - Uncomfortable workers – distancing and wearing masks is challenging!

Cleaning, Sanitizing and Disinfecting basics

NC STATE UNIVERSITY

Clean, Sanitize, Disinfect: What are the differences?

Clean	Sanitize	Disinfect
Physical removal of soil and food residue from surfaces which can include the use of clean water and detergent.	Treatment of a cleaned surface to reduce the number of microorganisms of public health significance to a safe level within 1 minute.	Treatment of a cleaned surface to destroy or inactivate ~~all infectious organisms~~ on hard surfaces within 10 minutes.
All surfaces	**Food contact surfaces (99.999% reduction)** **Non-food contact surfaces (99.9% reduction)**	**Non-food contact surfaces, high touch surfaces, incident with infected person**

A broader spectrum of organisms

[NCSU Novel Coronavirus Considerations for Small Farms webinar]

UMass Extension

Cleaning, Sanitizing and Disinfecting basics

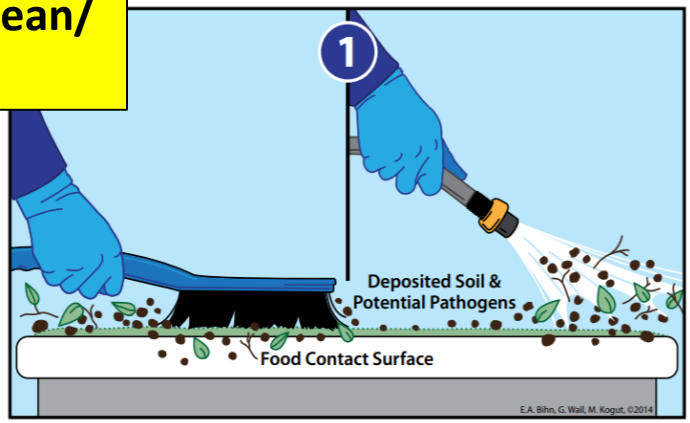
Sanitizers	Disinfectants
EPA-registered	EPA-registered
Food contact surfaces (and non food contact surfaces	Non-food contact surfaces
Reduce bacterial load 99.999% on food contact surfaces; 99.9% on non-food contact surfaces	Destroy/inactivate 100% of certain infectious microorganisms (such as bacteria and viruses) and fungi; exception includes bacterial spores
Lower concentration and shorter contact time (within 1 minute)	Higher concentration and longer contact time (within 10 minutes)
Cannot have artificial scents or perfumes for use on food contact surfaces	May include artificial scents and perfumes
Tested against bacterial pathogens only (*E.coli*, *Salmonella* Typhimurium, *Staphylococcus aureus*)	May be effective against bacteria, viruses, and fungi; must be tested against every organism the label claims to kill
Used throughout the food industry	Typically used in hospitals, nursing homes, hotels

NCSU Novel Coronavirus Considerations for Small Farms webinar

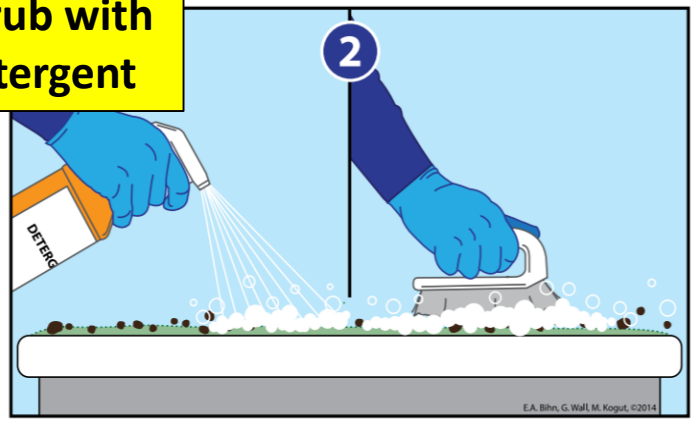
Cleaning, Sanitizing and Disinfecting basics

The 4-step cleaning process – can't sanitize or disinfect a dirty surface

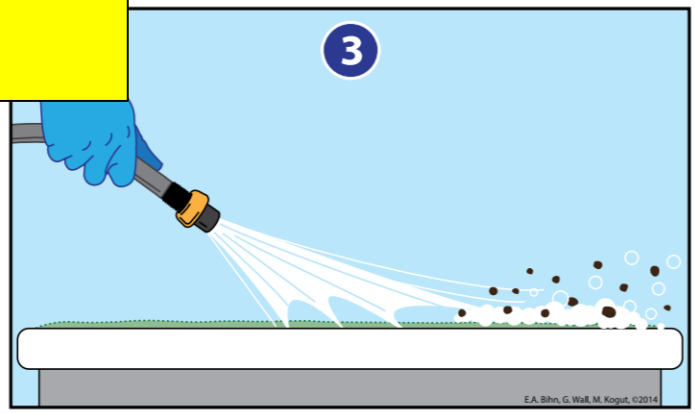
1. Pre-clean/ rinse



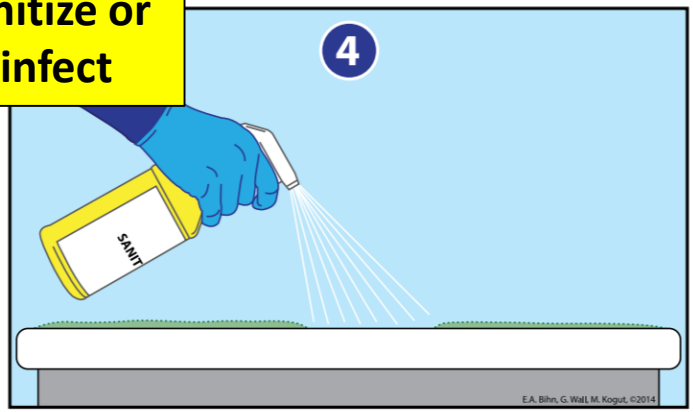
2. Scrub with detergent



3. Rinse



4. Sanitize or disinfect



Produce Safety Alliance, Cleaning vs. Sanitizing

UMass Extension

When to Sanitize or Disinfect?

Non-Food Contact Surfaces	Food Contact Surfaces	High Frequency Touch Points
		
		

[Images (not highlighting) from Washington State Department of Ag Guidance for Small Farms webinar]

Routine cleaning and **sanitizing**

Sanitizing *is appropriate for food contact surfaces and for routine sanitation of surfaces that are of low risk for contamination with a viral pathogen*

UMass Extension

When to Sanitize or Disinfect?

Non-Food Contact Surfaces	Food Contact Surfaces	High Frequency Touch Points
		
		

[Images (not highlighting) from Washington State Department of Ag Guidance for Small Farms webinar]

Routine cleaning and **disinfecting**

Disinfecting *is appropriate for hard, non-porous, non-food contact surfaces, such as door handles, railings, trash cans, credit card & POS terminals, restrooms, and other high-touch surfaces*

UMass Extension

When to Sanitize or Disinfect?

Non-Food Contact Surfaces	Food Contact Surfaces	High Frequency Touch Points
		
		

[Images (not highlighting) from Washington State Department of Ag Guidance for Small Farms webinar]

Cleaning and **disinfecting** when confirmed or likely case of COVID-19

Disinfecting *of all affected surfaces may be required if someone was ill, there were bodily fluids present, or surfaces were exposed to a high-risk area*

UMass Extension

When to Sanitize or Disinfect?

In the event that someone on your **farm is confirmed or likely to be ill with COVID-19**

- Isolate affected workspaces
- If possible, ventilate and leave unoccupied for 24 hours
- **Disinfect** affected surfaces with an appropriate disinfectant

If any **food contact surfaces** require **disinfection**

- Follow instructions for the disinfectant product you're using
- Make sure product remains wet on the surface for the appropriate contact time
- **Rinse with potable water** and sanitize as normal and air dry
  - Additional rinse step prevents the disinfectant from contaminating food
  - Additional sanitizer step reduces any microbial risks introduced by the rinse step

What to Use?

Cleaning

- Use detergents appropriate for food contact surfaces
- All-purpose household cleaners (e.g., Simple Green, Seventh Generation, Fantastik, …)
- Not EPA registered

What to Use?

Sanitizing

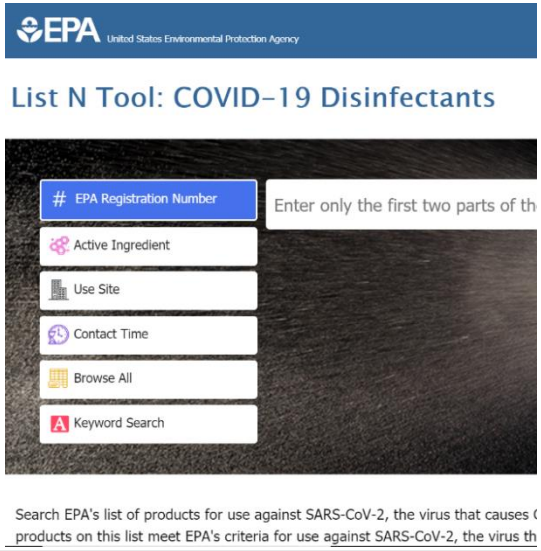
- EPA registered
- Labeled for uses, with instructions
  - Inc. rates and contact/wet times
- Labeled for human health pathogens
- Can use bleach (sodium hypochlorite) and PAA (peroxyacetic acid) products
- E.g., Ultra Clorox Brand Regular Bleach, Sanidate, Tsunami
- Produce Safety Alliance
  - Selecting an EPA-labeled Sanitizer
  - Labeled Sanitizers for Produce - Excel Tool
  - Video Tutorial: How to Use the Excel Tool Labeled Sanitizers for Produce

What to Use?

List includes:
- Bleach
- Isopropyl alcohol, 70%
  - swabs
    good for phones, technology
- Hydrogen peroxide

Disinfecting

- EPA registered
- EPA N-list
- SARS-CoV-2 is a new pathogen, most products have not been evaluated, will likely not be on the label
- Demonstrated efficacy against other human coronaviruses, harder to kill viruses
- List being updated regularly with more products
- Most products are more common in institutional or healthcare settings
- Products more common on farms share active ingredients (sodium hypochlorite, PAA)



List N: Products with Emerging Viral Pathogens AND Human Coronavirus claims for use against SARS-CoV-2
Date Accessed: 05/27/2020

EPA Registration Number	Active Ingredient(s)	Product Name	Company	Follow the disinfection directions and preparation for the following virus	Contact Time (in minutes)	Formulation Type	Surface Type	Use Site	Emerging Viral Pathogen Claim?	Date Added to List N
91861-2	Hydrogen peroxide	Bona STL Disinfecting Cleaner	Bonakemi USA Inc	Rhinovirus	10	RTU	Hard Nonporous (HN); Food Contact Post-Rinse Required (FCR)	Healthcare; Institutional; Residential	Yes	05/21/2020
5813-124	Sodium hypochlorite	Clorox Bleach Blanqueador	The Clorox Company	Canine parvovirus; Feline parvovirus	10	Dilutable	Hard Nonporous (HN); Food Contact Post-Rinse Required (FCR)	Healthcare; Institutional; Residential	Yes	05/21/2020
5813-121	Sodium hypochlorite	CRB I	The Clorox Company	Canine parvovirus; Feline parvovirus:	10	Dilutable	Hard Nonporous (HN); Food Contact	Healthcare; Institutional; Residential	Yes	05/14/2020

UMass Extension

What to Use?

UVM Ag Extension Engineering: A Guide to Cleaning, Sanitizing, and Disinfecting

Product	Active Ingredients as Received	Labeled Concentration for Wash Water Treatment	Labeled Concentration for Sanitizing Hard Surfaces	Labeled Concentration for Disinfecting Hard Surfaces
Ultra Clorox Brand Regular Bleach	6.0% sodium hypochlorite	**25 ppm** free chlorine 1/2 cup per 75 gallons 2 minute submersion time	**200 ppm** 1 tbsp per 1 gallon of water. 2 minutes contact time.	**2700 ppm** ¾ cup per gallon of water. 5 minutes contact time.
Sanidate 5.0	5.3% peroxyacetic acid (PAA) and 23.0% hydrogen peroxide	**27-96 ppm PAA** 59.1-209.5 fl. oz. per 1000 gallons of water	**147-500 ppm PAA** 1.6-5.4 fl. oz. per 5 gallons water. 2 minutes contact time.	**230-1000 ppm** PAA 0.5-2.2 fl. oz. per gallon of water. 10 minutes contact time.
Tsunami 100	15.2% peroxyacetic acid (PAA) and 11.2% hydrogen peroxide	**30-80 ppm PAA** 2.5-6.7 fl. oz. per 100 gallons of water	**150-270 ppm PAA** 1.0-1.8 ounces (product) per 8 gallons of water 1 minute contact time.	**Not Labeled**
Vigorox SP-15	15.0% peroxyacetic acid (PAA) and 10.0% hydrogen peroxide	**45 ppm PAA** 0.54 fl. oz. per 16 gallons of water	**85 ppm PAA** and 57 ppm hydrogen peroxide 3.1 fluid ounces per 50 gallons of water. 1 minute contact time.	**800 ppm PAA** and 530 ppm hydrogen peroxide. 3.0 fluid ounces of the product per 5 gallons of potable water. 5 minutes contact time.

No indication that covid-19 virus is transmitted by food and there is no need to use a sanitizer on crops or in wash water ***to control coronavirus***

UMass Extension

Some notes on bleach

CDC makes a general recommendation

for disinfection of coronavirus:

- **5 Tablespoons bleach per gallon of water**
- % sodium hypochlorite is not specified
- Aiming for at **least 1000 ppm** sodium hypochlorite for **disinfection**
- For any use over 200 ppm on **food contact surfaces**, must rinse with fresh water

How do I know if my bleach has expired?

On most bottles of bleach, there will be a 7 digit code printed on the bottle. This code contains the information you need to calculate the expiration date.

Let's take the code **E619337.** We need to break this code into 3 parts, starting from left to right.

The first two characters **E6**, tell us the facility the company manufactured the bleach.

The second two number **19**, tells us the year the company manufactured the bleach.

The last three numbers **337**, tell us the day of the year the company manufactured the bleach.

So, code **E619337** tells us this bottle of bleach was manufactured at facility **E6** in **2019** on the **337** day of the year, which is December 3.

This bottle of bleach expires one year from **December 3, 2019**, so it needs to be used or disposed of by **December 2, 2020**.

Michigan State University: COVID-19 – Disinfecting with Bleach

UMass Extension

More notes …

- Mixing – add product to water
- Use cool water
- Keep cool, out of sun
- Degrade quickly
- Higher temperature = faster degradation
- Only mix what you'll use
  - **Bleach**, replace solution every **24 hours**
  - **PAA solutions** should last **about a week**
- Monitor concentrations with test strips
  - Bleach: free/available chlorine, in the correct range
  - PAA: use PAA test strips
  - pH: efficacy affected by pH of water, esp. for **bleach**
    - Use pH strips to ensure w/in 6.5-7.5

UMass Extension

More notes …

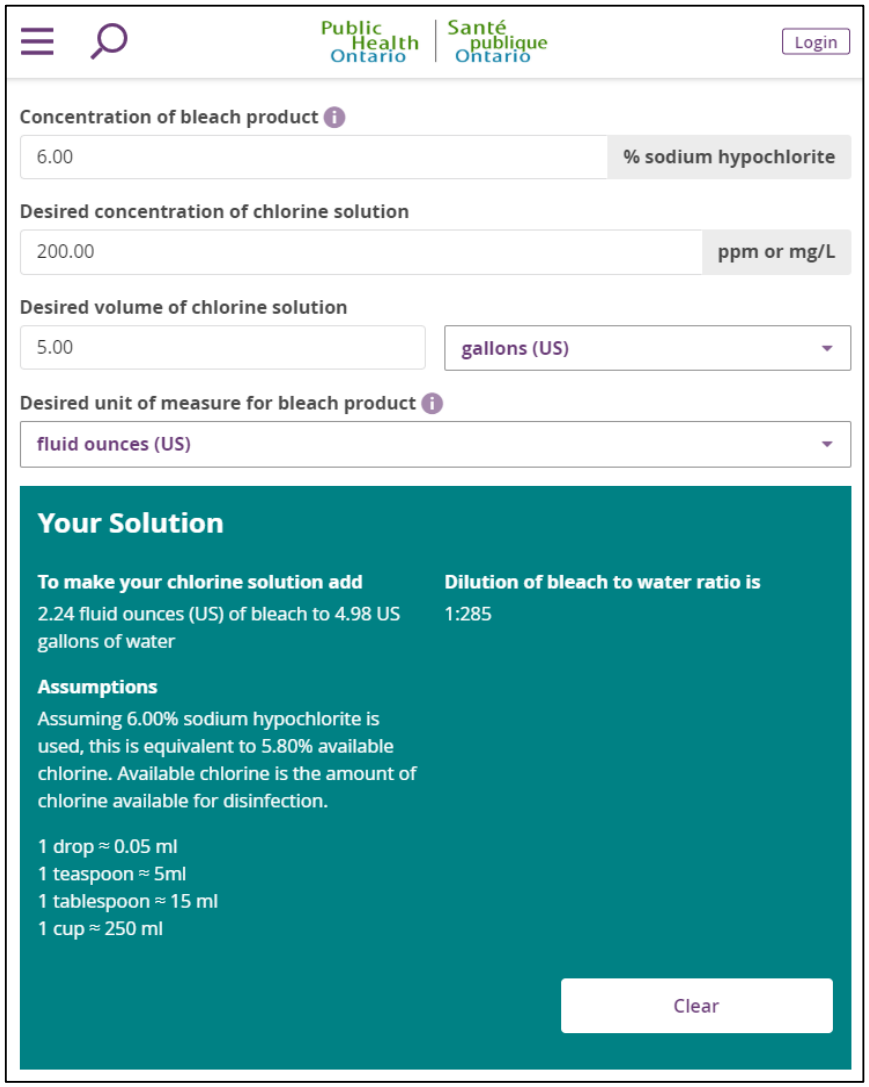
CONTACT/DWELL TIME

- **What is this?**
  - Contact time or dwell time is the time it takes for a product to 'work' or to kill the target virus. The contact times on the label are associated with the viruses that have been tested in the lab. If the label says 3 min for Human Coronavirus, then it takes the product 3 mins to kill that virus. The product should not dry out before that time as it won't have enough time to work. The best way to ensure contact time is to thoroughly wet the surface or to reapply product if necessary.
- **My chemical supplier tells me that his product only needs 60 seconds to work, but other products take 10 mins? Can his really work in 60 seconds?**
  - Some products do indeed have short contact or dwell times and some take up to 10 mins to be effective. If you are unsure about what your chemical provider is telling you, ask to see the label. The contact time, concentration and target virus are all interrelated.
  - Check that the contact time lines up with the right concentration and is associated with the virus you want to kill. Remember that a label can have multiple claims, sanitizer (not suitable for viruses), disinfectant, etc. Always ask to see proof of the claims a chemical supplier is making.

PSA, Setting the Record Straight on Cleaning and Sanitizing

UMass Extension

Chlorine Dilution Calculator

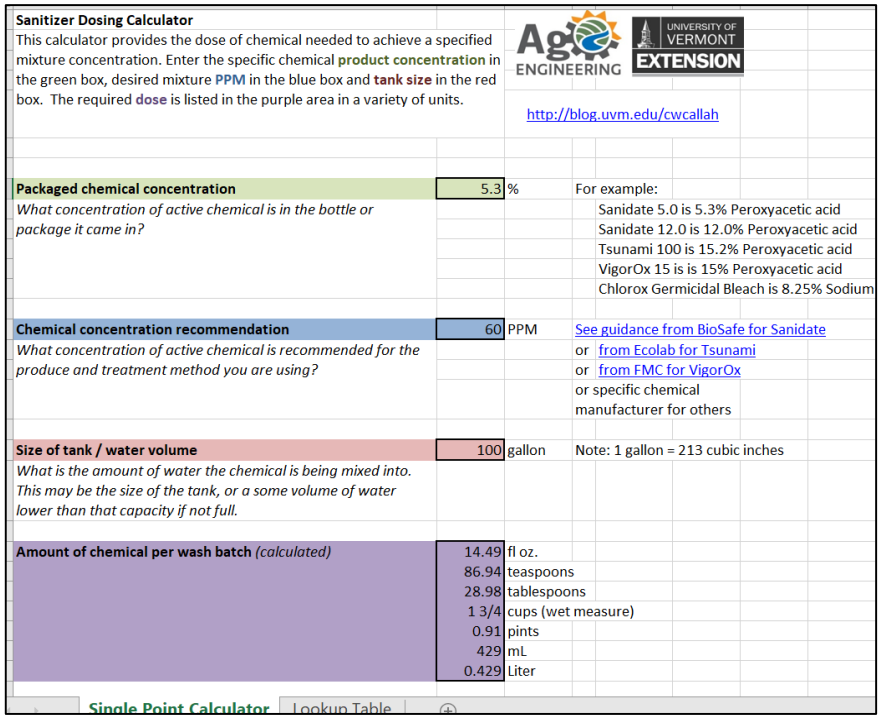


https://www.publichealthontario.ca/en/health-topics/environmental-occupational-health/water-quality/chlorine-dilution-calculator

2015-06-16

Doser for Small Scale Vegetable Washing with Sanitizer

BY CHRIS CALLAHAN



Sanitizer Dosing Calculator

This calculator provides the dose of chemical needed to achieve a specified mixture concentration. Enter the specific chemical **product concentration** in the green box, desired mixture **PPM** in the blue box and **tank size** in the red box. The required **dose** is listed in the purple area in a variety of units.

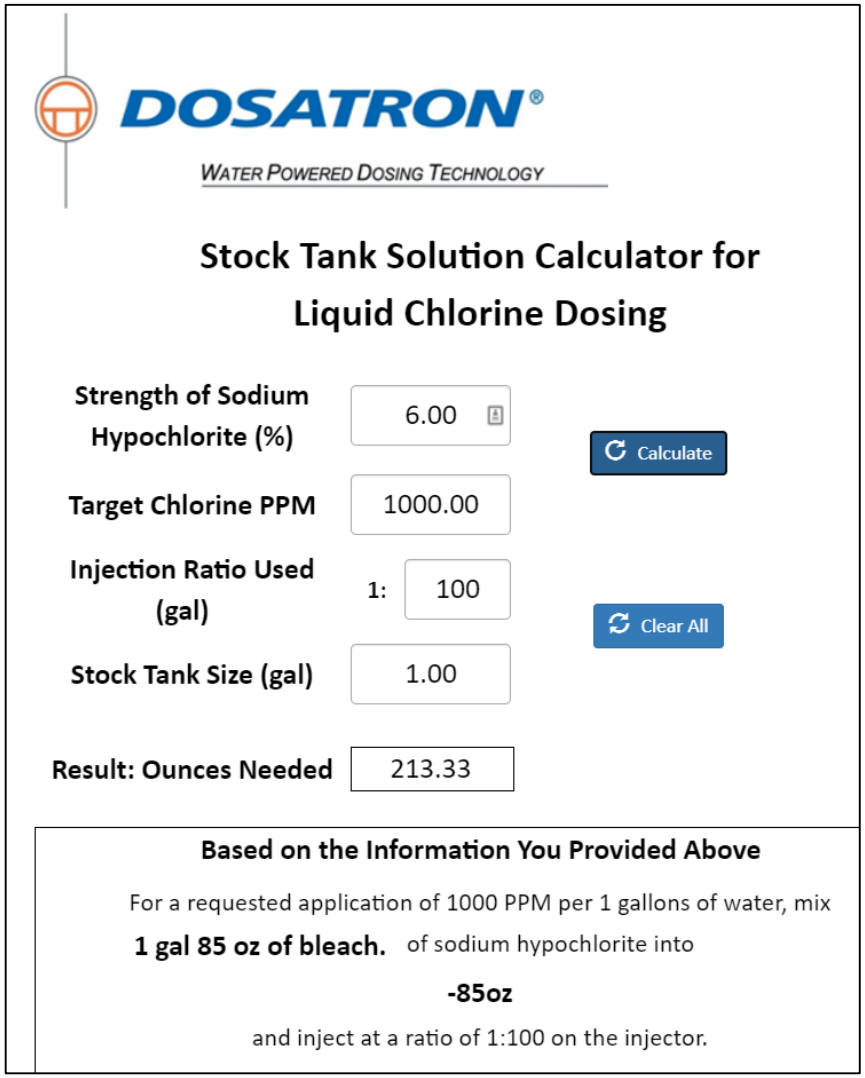
Ag ENGINEERING | UNIVERSITY OF VERMONT EXTENSION

http://blog.uvm.edu/cwcallah

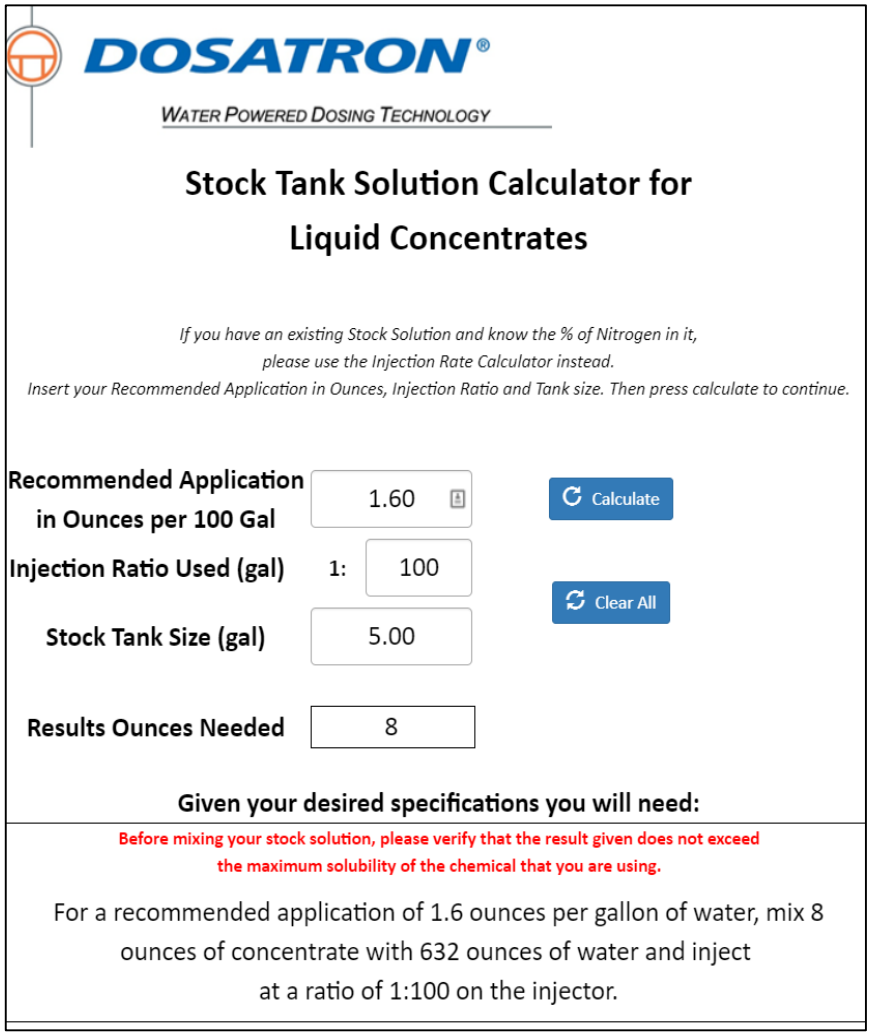
Packaged chemical concentration *What concentration of active chemical is in the bottle or package it came in?*	5.3	%	For example: Sanidate 5.0 is 5.3% Peroxyacetic acid Sanidate 12.0 is 12.0% Peroxyacetic acid Tsunami 100 is 15.2% Peroxyacetic acid VigorOx 15 is is 15% Peroxyacetic acid Chlorox Germicidal Bleach is 8.25% Sodium
Chemical concentration recommendation *What concentration of active chemical is recommended for the produce and treatment method you are using?*	60	PPM	See guidance from BioSafe for Sanidate or from Ecolab for Tsunami or from FMC for VigorOx or specific chemical manufacturer for others
Size of tank / water volume *What is the amount of water the chemical is being mixed into. This may be the size of the tank, or a some volume of water lower than that capacity if not full.*	100	gallon	Note: 1 gallon = 213 cubic inches
Amount of chemical per wash batch *(calculated)*	14.49 86.94 28.98 1 3/4 0.91 429 0.429	fl oz. teaspoons tablespoons cups (wet measure) pints mL Liter	

Single Point Calculator | Lookup Table

https://blog.uvm.edu/cwcallah/2015/06/16/doser-for-small-scale-vegetable-washing-with-sanitizer/



https://www.dosatronusa.com/calculators/Chlorine-Calculator-EN/Simple-Chlorine-Calculator.htm



https://www.dosatronusa.com/calculators/LiquidConcentratesnonfert/LiquidConcentratesnonfert.htm

UMass Extension

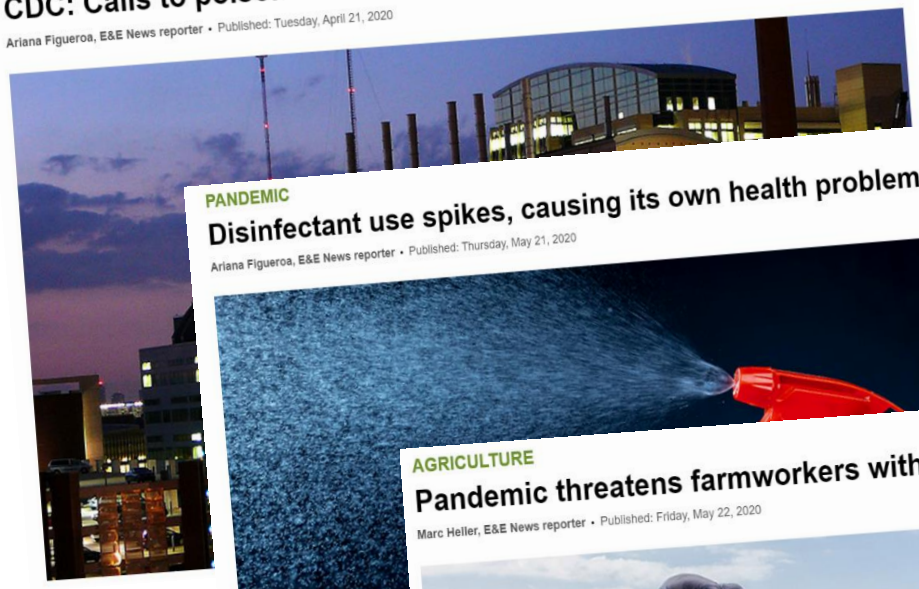
A Note on Safety

- Follow the label
- Have access to MSDS
- Ensure good ventilation
- Wear proper PPE
  - E.g., gloves, goggles
- Wiping may be better than spraying
- Avoid fragrances

CHEMICALS

CDC: Calls to poison centers surged since onset of pandemic

Ariana Figueroa, E&E News reporter • Published: Tuesday, April 21, 2020



PANDEMIC

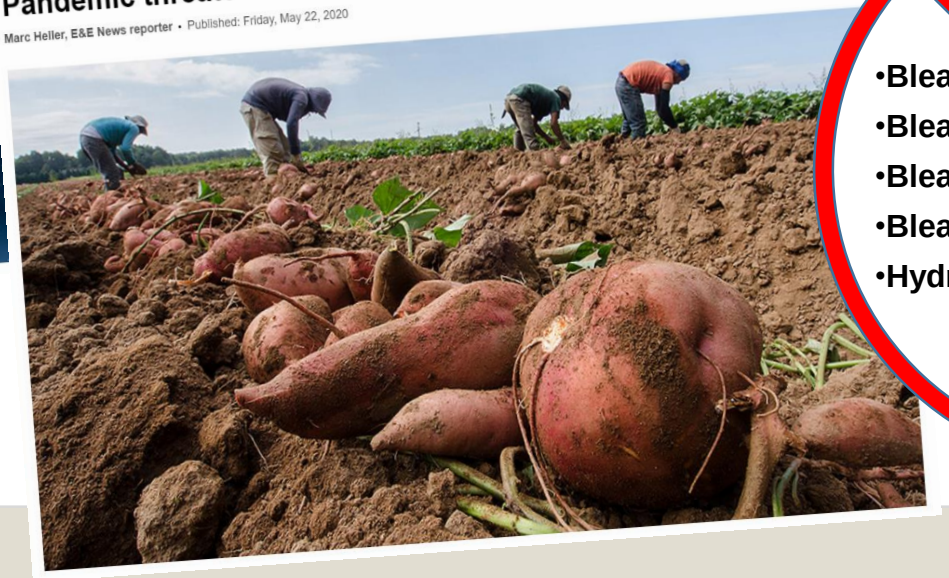
Disinfectant use spikes, causing its own health problems

Ariana Figueroa, E&E News reporter • Published: Thursday, May 21, 2020

AGRICULTURE

Pandemic threatens farmworkers with double dose of chemicals

Marc Heller, E&E News reporter • Published: Friday, May 22, 2020



NEVER mix chemicals

- **Bleach and Vinegar**
- **Bleach and Ammonia**
- **Bleach and Toilet Bowl Cleaner**
- **Bleach and Rubbing Alcohol**
- **Hydrogen Peroxide and Vinegar**

UMass Extension

Frequency

NC STATE UNIVERSITY

Suggested Frequencies of Cleaning, Sanitizing, and Disinfecting

	Clean	Sanitize	Disinfect
	All surfaces	Food contact surfaces and non-food contact surfaces	Non-food contact surfaces - high touch surfaces; incident with infected person
Frequency			
	Every day and before sanitizing or disinfecting surfaces	Food contact surfaces: once per day Non-food contact surfaces: daily, weekly, monthly, etc.	At least twice per day for high touch surfaces

Sample Sanitation Schedule

Equipment/Area	Cleaning Frequency	Person Responsible
iPad in payment area	Every 2 hrs	Bobby Smith
Table in packaging area	Daily	Mary Smith
Conveyor belt (drying to packaging)	Daily	Mary Smith
Rollers	Daily	John Alberts
Wash tank	Daily	John Alberts
Packaging area walls	Weekly	Suzie Campbell

[Blank Sanitation Schedule template]

Cleaning and Sanitizing Record *Template*

Name and address of farm: _____

List the date, time, tool or equipment name, and method for each cleaning or sanitizing activity.

Date	Time	List tools/equipment	Cleaned and/or Sanitized?	Method used	Cleaned By (initials)
10/11/16	*10:07 AM*	*Harvest tools*	*cleaned*	*See Cleaning SOP (Removed dirt with brush, washed with detergent, rinsed, air dried)*	*EAB*
10/11/16	*10:30 AM*	*Dump Tank*	*cleaned and sanitized*	*See Dump Tank Cleaning and Sanitizing SOP (drained tank, washed with detergent, rinsed, sanitized with 150 ppm NaOCl)*	*EAB*

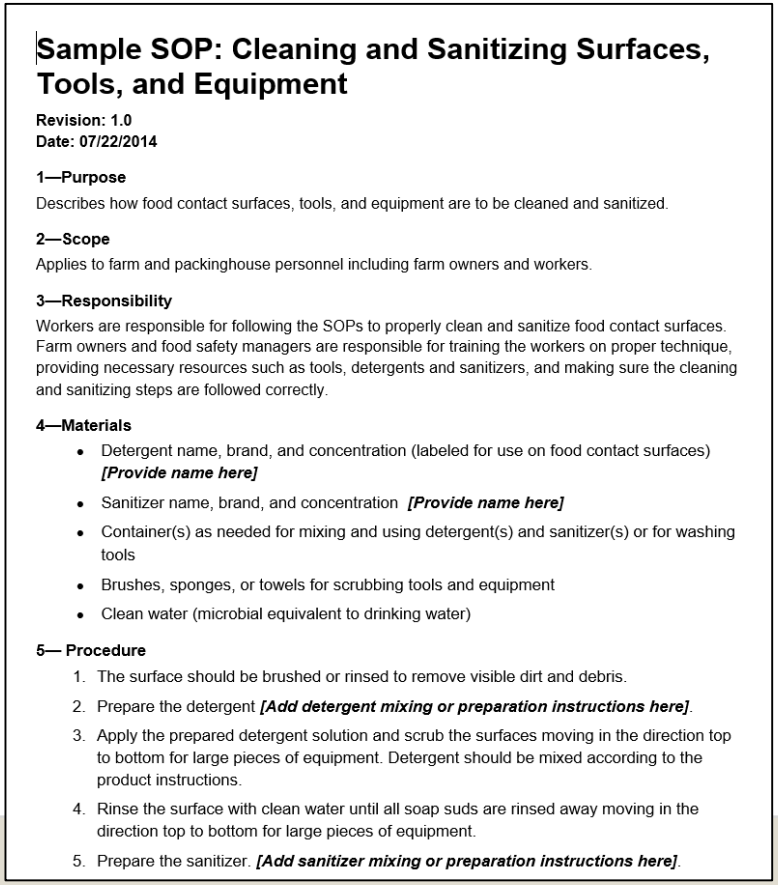
[Produce Safety Alliance Record Keeping Template]

SOPs

Elements of an SOP

- **Title**
- **Objective/purpose**—what task are you accomplishing and why?
- **Scope**—where and to whom does the SOP apply?
- **Responsibility**—who is responsible for making sure the task is completed?
- **Materials**—what specific items are needed to complete the task?
- **Procedure**—what are the steps to the task, in order?
- **Verification/documentation**—how will you verify that the procedure was completed correctly and what records will you keep?

Fillable SOP template



Sample SOP: Cleaning and Sanitizing Surfaces, Tools, and Equipment

Revision: 1.0
Date: 07/22/2014

1—Purpose

Describes how food contact surfaces, tools, and equipment are to be cleaned and sanitized.

2—Scope

Applies to farm and packinghouse personnel including farm owners and workers.

3—Responsibility

Workers are responsible for following the SOPs to properly clean and sanitize food contact surfaces. Farm owners and food safety managers are responsible for training the workers on proper technique, providing necessary resources such as tools, detergents and sanitizers, and making sure the cleaning and sanitizing steps are followed correctly.

4—Materials

- Detergent name, brand, and concentration (labeled for use on food contact surfaces) ***[Provide name here]***
- Sanitizer name, brand, and concentration ***[Provide name here]***
- Container(s) as needed for mixing and using detergent(s) and sanitizer(s) or for washing tools
- Brushes, sponges, or towels for scrubbing tools and equipment
- Clean water (microbial equivalent to drinking water)

5— Procedure

1. The surface should be brushed or rinsed to remove visible dirt and debris.
2. Prepare the detergent ***[Add detergent mixing or preparation instructions here]***.
3. Apply the prepared detergent solution and scrub the surfaces moving in the direction top to bottom for large pieces of equipment. Detergent should be mixed according to the product instructions.
4. Rinse the surface with clean water until all soap suds are rinsed away moving in the direction top to bottom for large pieces of equipment.
5. Prepare the sanitizer. ***[Add sanitizer mixing or preparation instructions here]***.

Cornell GAPs Program

Questions?

Ideas?

We will post a resource list and Q&A document when we post the recording of this webinar

UMass Extension