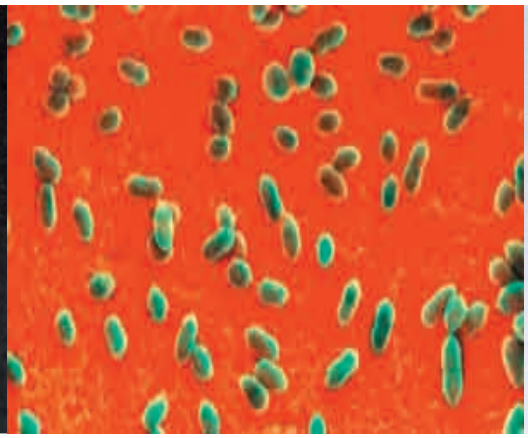
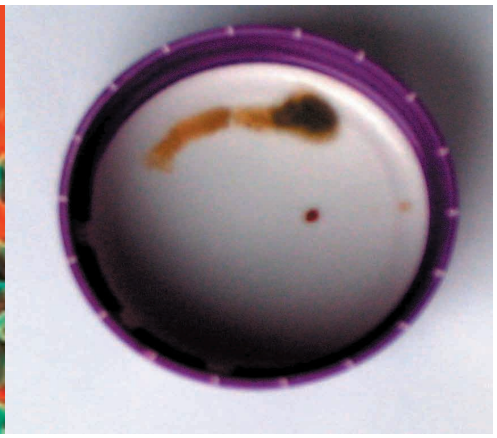




TECH TIPS

Issue #11 October 2006

Sanitizer Rotation

What is microbial resistance?

Microbial resistance is broadly defined as the ability of the microbe to survive and propagate under conditions that were previously lethal. Some of these conditions include temperatures, pH, water availability, and chemical exposure.

JohnsonDiversey

What types of microbial resistance are there?

The two accepted types of microbial resistance that exist are:
1) Intrinsic
2) Acquired

Intrinsic resistance is the microbe's natural ability to survive certain types of chemicals. For example, Iodophores are effective against various Gram positive and Gram negative bacteria but are less effective against spores or bacteriophage.

Acquired resistance is when organism strains have survived sub-lethal exposure to chemicals. Sub-lethal exposure can be low concentrations of acids or low parts per million (ppm) of chemicals.

There are many types of acquired resistance. Some are listed below:

1) Acid Tolerance:	Tolerance to acidic conditions.
2) Thermo Tolerance:	Tolerance to thermal conditions.
3) Cryo Tolerance:	Tolerance to freezer, or sub-zero, conditions
4) Chemical Tolerance:	Tolerance to chemical exposure

What is the goal for plant sanitizing?
There are two goals for plant sanitizing. The first is to maintain control of the plant sanitizing program and the second is to prevent any existing microbial situation from becoming worse.

A plant can maintain control of their sanitizing program by identifying areas of concern and maintaining them on a master Standard Sanitation Operating Procedure (SSOP)schedule. This includes the identification of problem areas (biofilm formations, bioaerosols, etc.) and the routine monitoring of these areas by microbiological means (either by ATP, daily plating, or monthly baseline numbers).

Preventing existing situations from worsening can be accomplished by easily putting the plant on a sanitizer rotation program. It is recommended that plants alternate sanitizers during the week to prevent bioresistance or proliferation of specific flora [1].

Why rotate sanitizers?
The reason for sanitizer rotation is that using only one type of sanitizer may eliminate one type of organism, but allows others to proliferate instead. For example, a plant uses a germicide/sanitizer that is highly effective against Gram positive bacteria. However, the germicide/sanitizer actually allows Gram negative bacteria to flourish because there are no Gram positive bacteria to compete for resources. The plant can combat this issue by using a different type of germicide/sanitizer once a week that is more efficacious against Gram negative bacteria thus leveling the microbial field.

In what area of a plant are sanitizers rotated?
Sanitizers are normally related in enviromental areas. An example of environmental sanitizer rotation would be Monday and Tuesday the plant uses a quaternary ammonium compound to sanitize. Wednesday the plant switches to a chlorinated sanitizer. On Thursday and Friday, the plant returns to the original quaternary compound used at the beginning of the week [2].

Doesn't switching sanitizers to something like chlorine cause additional corrosion problems?
Sanitizers are highly effective and are relatively low in corrosion when they are used at the appropriate use dilution. Please refer to the label for the correct dosage rate, metal interactions if listed, and contact times for sanitizing.

SANITIZER ROTATION

What are some issues with sanitizer rotation?

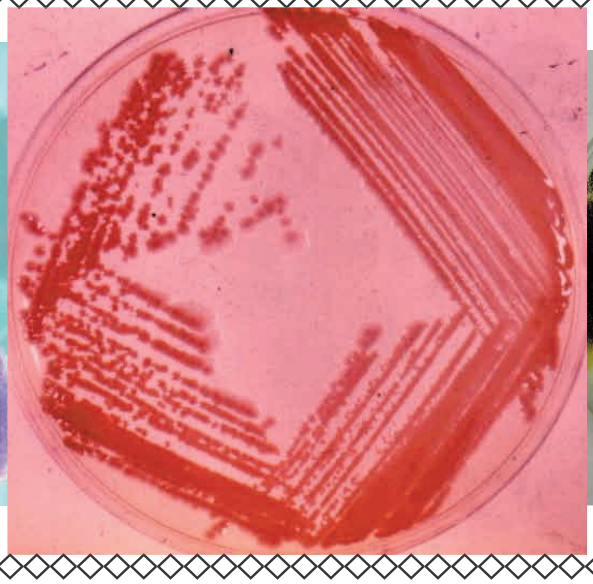
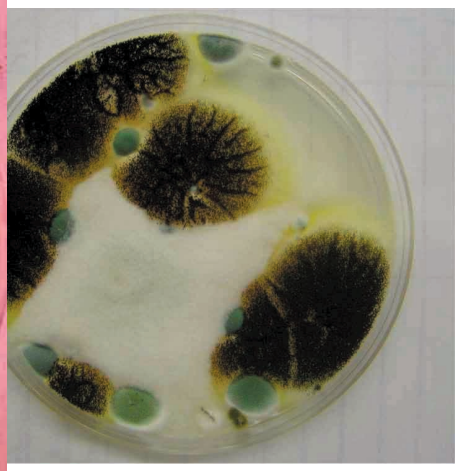
1) Some sanitizers do not mix. For instance do not use an acid cleaner/sanitizer then use a chlorinated sanitizer without rinsing well in between chemical applications. Nor should you mix a quat and chlorine without rinsing well. Both of these situations can produce a dangerous chemical reaction where toxic gases can be produced. It is best to thoroughly read all MSDS and technical data sheets prior to applications.

2) Most sanitizers are ineffective against large amounts of organic debris. Residual organic debris will effectively cancel the germicidal ability to sanitize. To enhance the effectiveness of a germicide/sanitizer, a thorough cleaning of the equipment, or area to be sanitized, is necessary. Consider this example, a chlorinated germicide/sanitizer solution is made at 200 ppm available chlorine. However, after application, the chemical is showing only 50 ppm chlorine (or sodium hypochlorite - NaOCl) when measured. The final concentration should have been 200 ppm. 50 ppm is too low of a dose to effectively sanitize and is providing sub-lethal killing ability. A sub-lethal dose can help microorganisms become resistant. With this example there are a couple of points to be made. First of all remember, **"a dirty surface cannot be sanitized"**. It is important to thoroughly clean equipment before sanitizing. Suppose though, this was a food contact surface and for whatever reason the sanitizer was losing strength when contacting the surface. There is a technique called "Double Sanitizing". In Double Sanitizing the surface is exposed to a stronger solution; for instance, 800 ppm sodium hypochlorite (NaOCl). The surface is then thoroughly rinsed with potable water then sanitized with 200 ppm NaOCl. In this case, the 800 ppm NaOCl oxidizes away any interference; 200 ppm is the legal no-rinse level for NaOCl.

3) Employees may not follow the master sanitation schedule. Employees may routinely forget to rotate sanitizers. The sanitation schedule must be clearly posted for all employees to follow.

These are just few of the issues that can occur when rotating sanitizers. Overall, rotation of sanitizers is more beneficial than harmful and should be a part of every plant's SSOP.

Remember, by following a master SSOP schedule that utilizes a sanitizer rotation, plants can both maintain biological control of their environment and prevent any existing microbial situations from worsening.

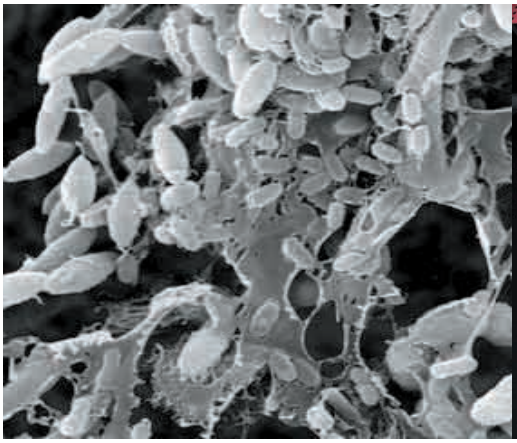




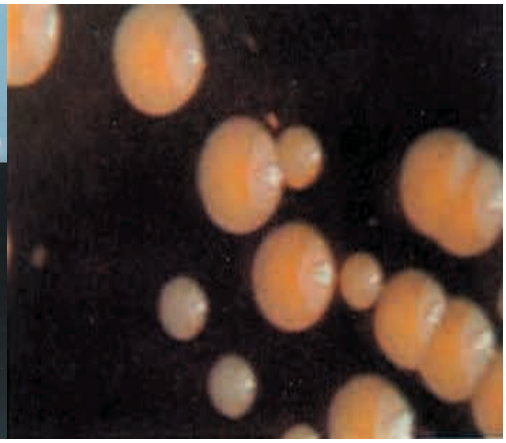
References

1. Gregersen, J. Clean Sweep Sanitizers and Disinfectants are Only as Good the SSOP's that Govern Them, Meat Mark. Technology, 53-58, 2005

2. Cramer, M. Food Plant Sanitation- Design, Maintenance, and Good Manufacturing Practices, pages 148-150, CRC Press, 2006

3. Yousef, A. and Juneja, V. Microbial Stress Adaptation and Food Safety, CRC Press, 2003





JohnsonDiversey
United States
3630 East Kemper Road
Cincinnati, Ohio 45241
p:1-800-233-1000
f: 513-956-4841

JohnsonDiversey
Canada
2401 Bristol Circle
Oakville, Ontario L6H 6P1
p:1-800-233-1000
f: 905-829-1218

Or visit our website at: www.johnsondiversey.com

JohnsonDiversey