Active packaging for control of post harvest disease and eradication of citrus canker bacteria

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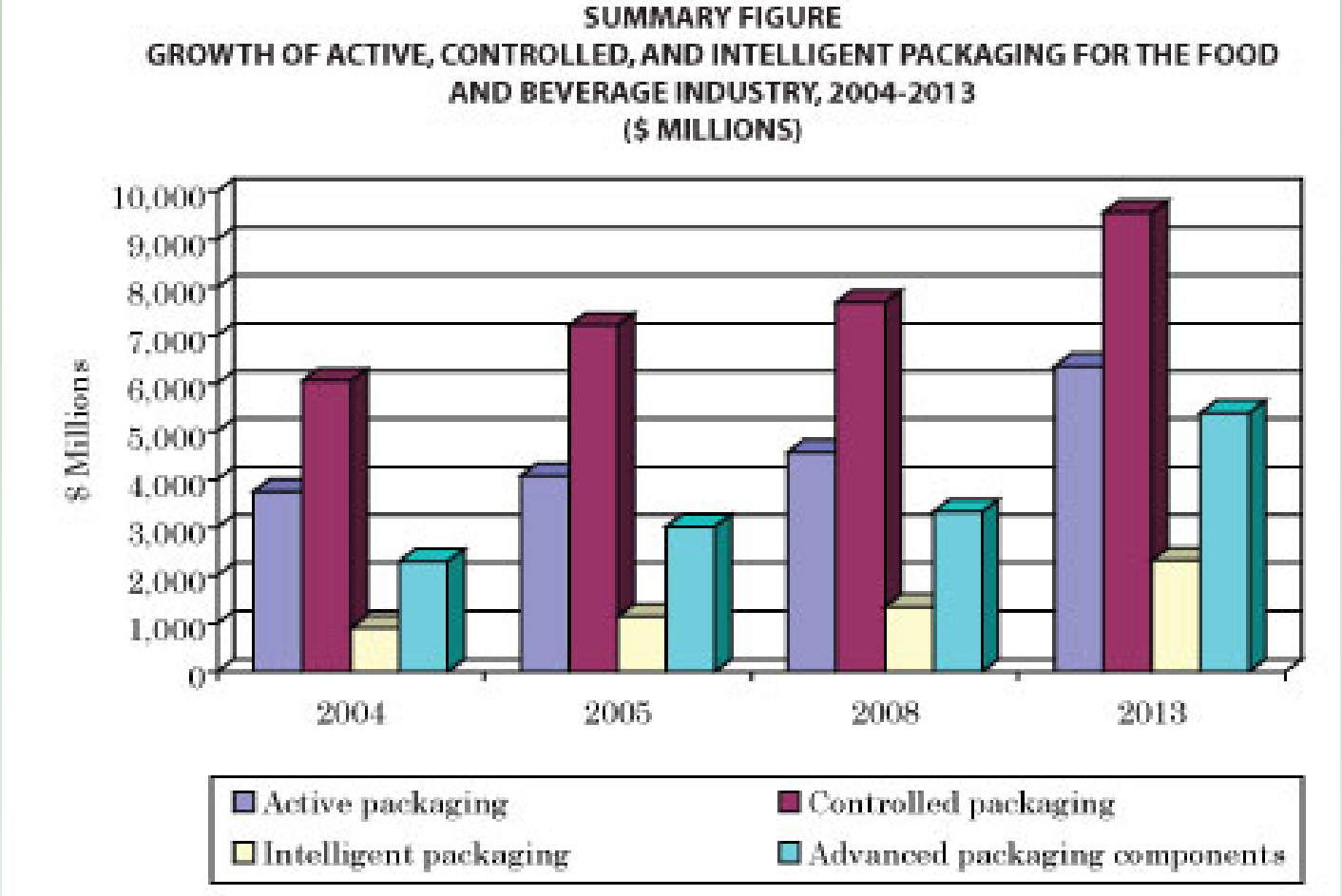
What is active packaging?

Active, intelligent and smart packaging refer to packaging systems used with products to help extend shelf life, monitor freshness, improve safety and convenience.

All are closely related: active usually means having active functions beyond the inert passive containment and protection of the product (desiccant).

Active packaging is becoming more common as shelf life and quality expectations change



Fresh citrus market needs a step to eradicate possible live Xcc from fruit to open markets and extend shelf life of fruit

Previous studies with chlorine dioxide in packaging did not work due to many environmental parameters necessary to make packaging active.

Studied active packaging with new formulation of chlorine dioxide: new packaging does not have same restriction as previous chlorine dioxide trials

Chlorine dioxide is a strong sanitizer. It is biocidal and rapidly kills a broad spectrum of organisms.

Strong oxidizer: oxidizer over a wide pH range

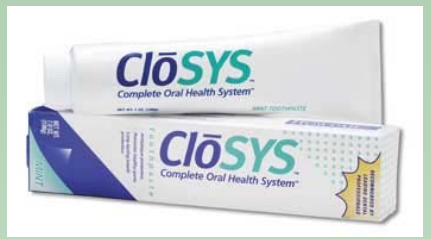
Most well known use as an approved water purifier

Scrubs industrial odors from the environment

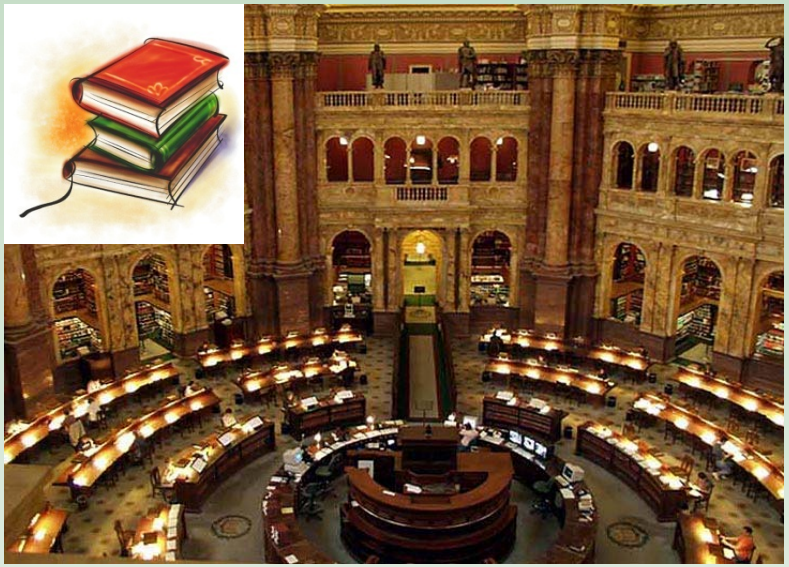
Used as an antimicrobial and sanitizer in produce flumes

Used in the paper/pulp industry to bleach wood fibers

Teeth whitener



1990's ClO_2 packets to remove mold from old books and manuscripts



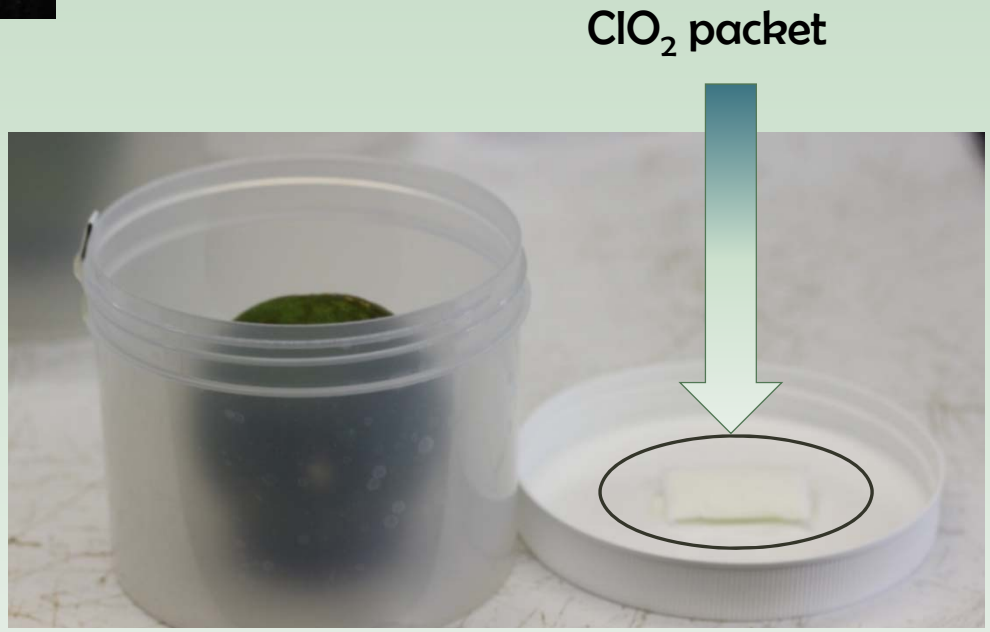
Began ClO_2 packaging studies with strawberries in commercial clamshells

ClO_2 in packaging

No ClO_2 in packaging

ClO_2 packaging with blueberries

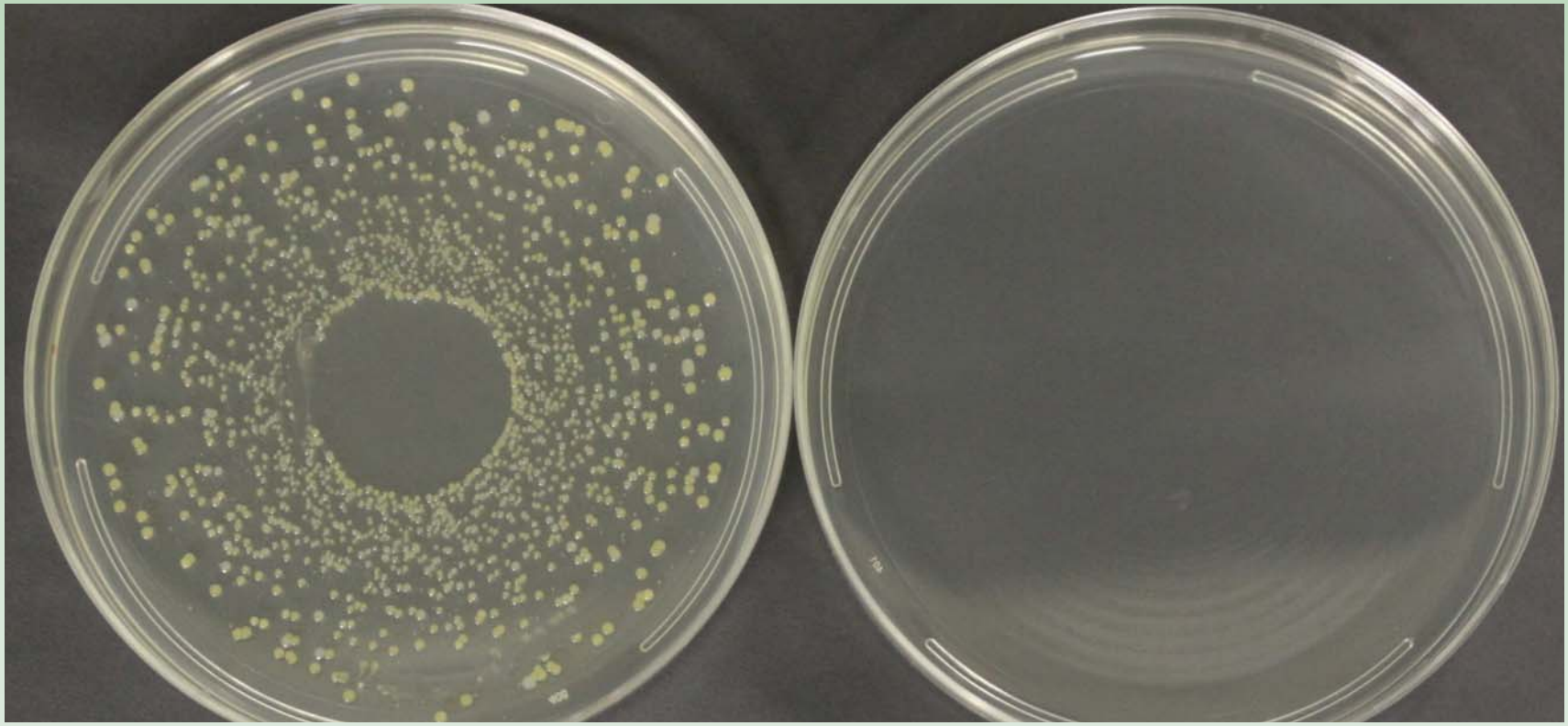
Experimental 'packaging' for citrus



No ClO_2 packet

Cells in periphery of lesion are killed

Ten days at 50º F: no Xcc isolated from lesions with ClO_2 exposure



No ClO_2 packet in packaging

ClO_2 packet in packaging

Future studies:

Experimenting with concentrations that are best for fruit and still efficient for destroying Xcc

Scale-up with cooperators to study actual effect in boxes under commercial conditions