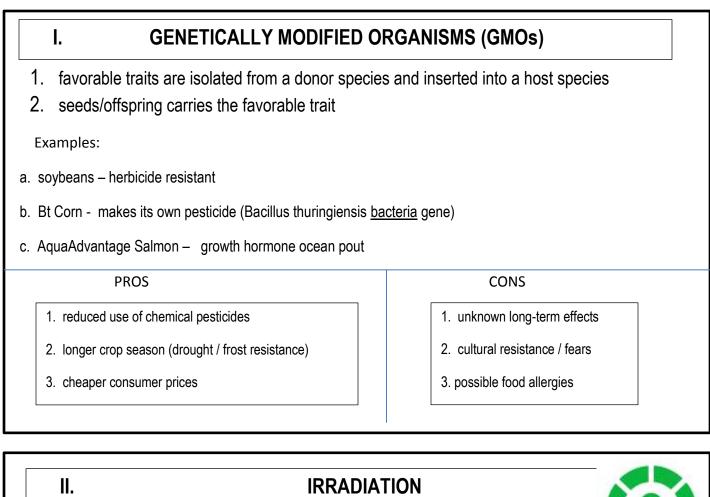
AIM: What methods are used to increase food supplies to feed a growing population?



expose food to ionizing energy (gamma and X-rays) to kill bacteria/insects in food

PROS

- 1. reduced foodborne illness
- 2. reduced use of pesticides
- 3. extends shelf-life

CONS

- 1. doesn't guarantee total food safety
- 2. mutations in bacteria more resistant?
- 3. fear of residual radiation

III. PESTICIDE USE

Pests - any unwanted organism that invades food sources, space, and/ or spread disease

- r-strategists

- **the natural checks and balances disrupted by monoculture has increased pest problems **

TYPES		
Broad Spectrum	Narrow Spectrum	
toxic to many species (ex. Sevin)	effective on a specific organism / group of organisms (ex. ant traps)	
herbicides, insecticides, fungicides, algicides, rodenticides, nematocides (worm pests)		
Contact	Systemic	
kills pests directly	 absorbed by a plant hen applied to seeds, soil, or leaves insects die by eating plant with toxin 	

CLASSES		
Inorganic	Organic / Botanical	Synthetic
 toxic, persistent, broad spectrum "older": metal salts: 	plant extracts that break down into less harmful compounds	toxic, not naturally-derived, fat-soluble, persistent, mobile
mercury & lead (banned) arsenic (trying to ban) chromium copper (also a fungicide) "newer": borates (Borax), silicates	relatively safe for human handling pyrethrum, nicotine	chlorinated hydrocarbons DDT (mosquitoes) Chlordane (insects, termites) Lindane (still used in prescription lice shampoo)

PESTICIDE PROS	PESTICIDE CONS
 control/eliminate diseases mosquitoes - malaria / zika ticks - lyme/RMSF (Rocky Mt. scarlet fever) 	 kills non-target species – including predators of pests affects non-target areas (soil, air, water) bioaccumulation / biomagnification
2. increase food supplies	4. strong connections to human health problems (cancer, etc.)
3. lower consumer costs	5. genetic resistance apply pesticide and the most die, some survive ("selected")
4. increase farmer profits	"pesticide treadmill" "selected" resistant pests resurge apply more pesticide "selected" more resistant pests survive
5. easy to use / quick results	apply new pesticide (or increase concentration)

AP Environmental Science Topic 4 – Toxicology and Human Health