

IMPACT OF REDUCTION OF MRLS IN BANANA PRODUCTION AND EXPORT

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2021 MRL HARMONIZATION WORKSHOP WEBINAR

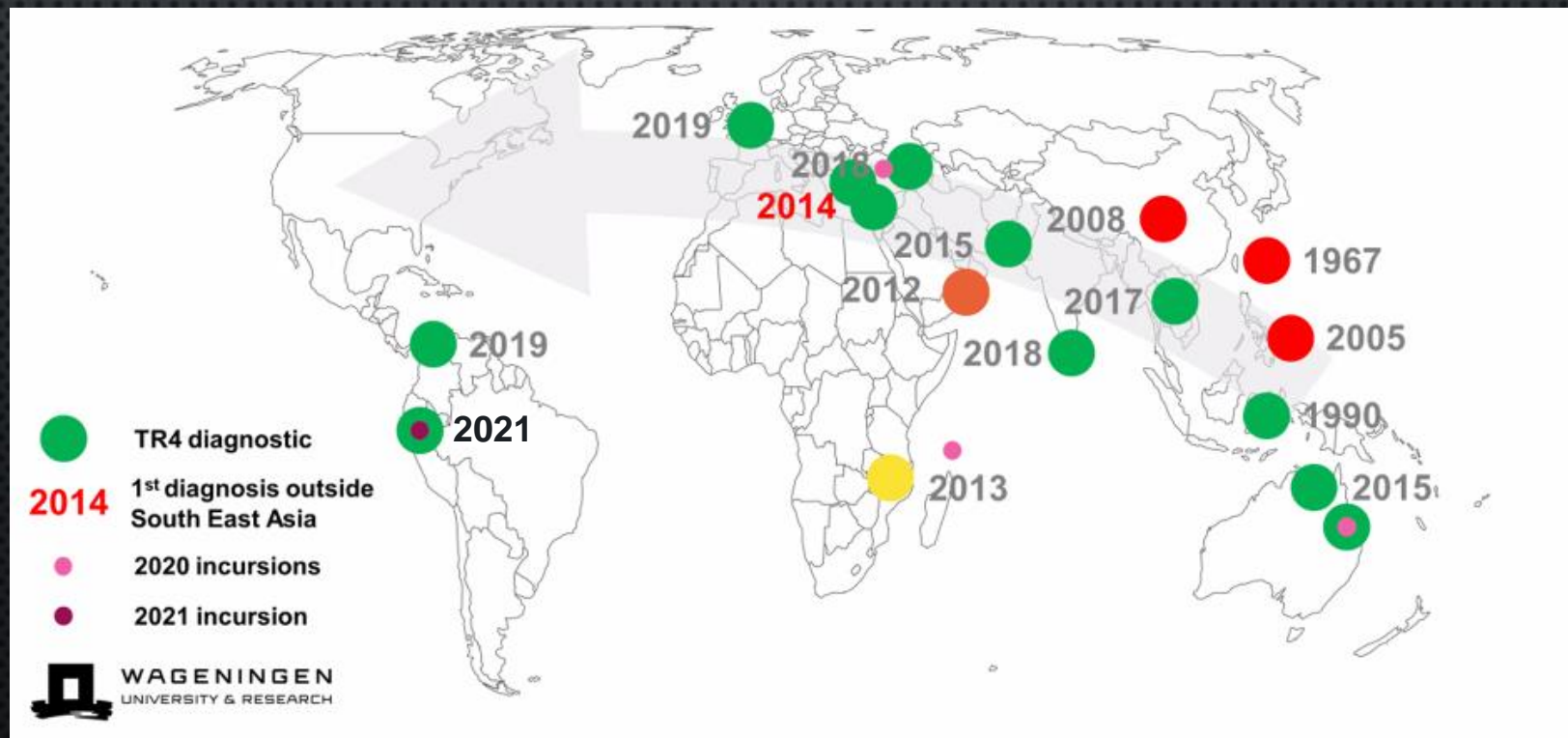
MAY 26-27, 2021

BANANA: THE BELEAGUERED WORLD'S FAVORITE FRUIT

- ACCORDING TO DATA FROM THE FAO, HUMANITY'S LOVE OF BANANAS MAY STILL BE ON THE RISE. ON AVERAGE; EVERY PERSON ON EARTH EATS 130 BANANAS A YEAR, AT A RATE OF NEARLY THREE BANANAS A WEEK.
- PRODUCTION OF BANANA HAS SEVERAL CHALLENGES IN THE NEAR FUTURE:
 - ADVANCE OF FUSARIUM WILT TR4
 - PRICE STAGNATION
 - INCREASED COST OF PRODUCTION
 - COMPROMISED INTEGRATED PEST MANAGEMENT SYSTEMS

ADVANCE OF FUSARIUM WILT

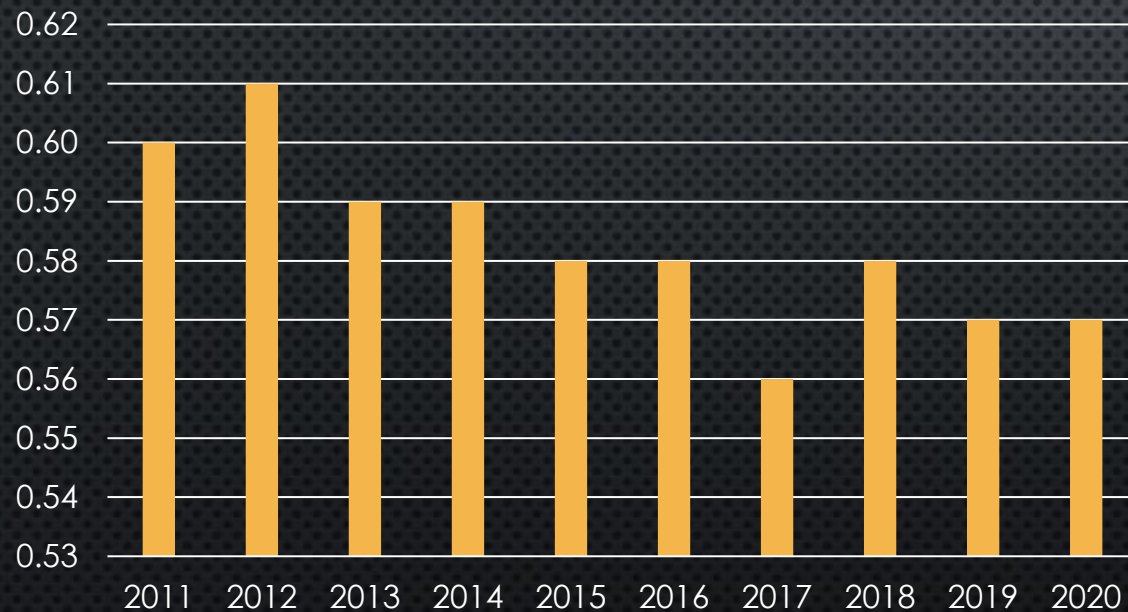
- BANANA FUSARIUM WILT CAUSED BY *FUSARIUM OXYSPOURUM* F. SP. *CUBENSE* (FOC TR4) POSES A SERIOUS THREAT TO BANANA PRODUCTION, IT ALSO AFFECTS PLANTAINS, BABIES, REDS AND OTHER MEMBERS OF THE *MUSA* FAMILY.
- THE MAP SHOW THE STEADY ADVANCE OF THE FUNGUS INTO LATINAMERICA, WITH THE LATEST REPORT FROM PERU IN APRIL, 2021.



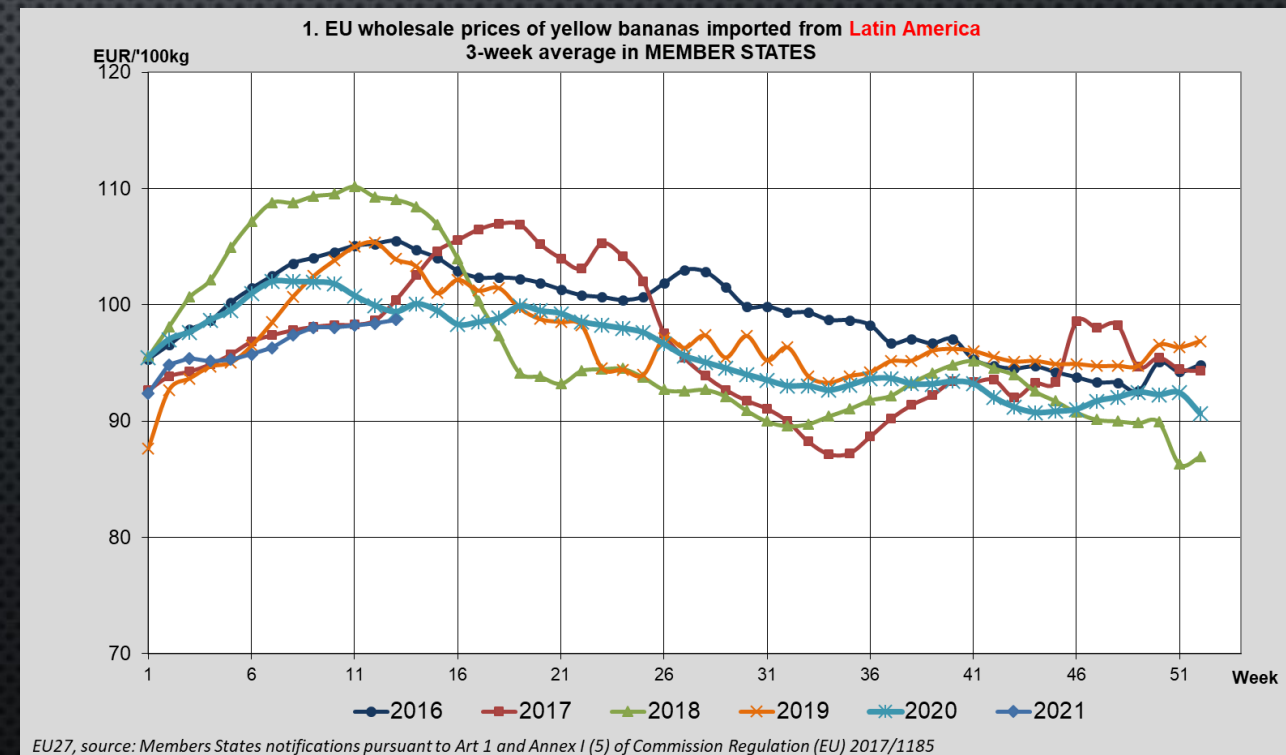
PRICE STAGNATION

- BANANA'S REPUTATION OF AVAILABILITY AND PRICE HAS REVEALED A CHINK IN THE ARMOUR, RETAILER PRICE WARS AND UBIQUITOUS OFFER RESULTS IN STEADY OR DECLINING RETAIL PRICES.

Retail price of Bananas in the United States
(in U.S. dollars per pound)

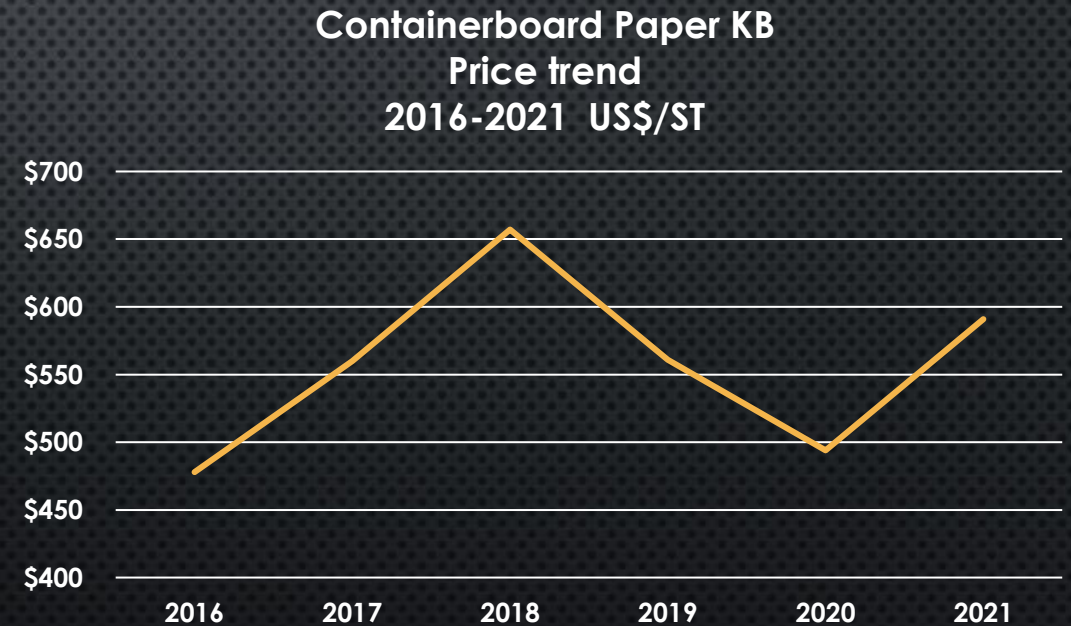
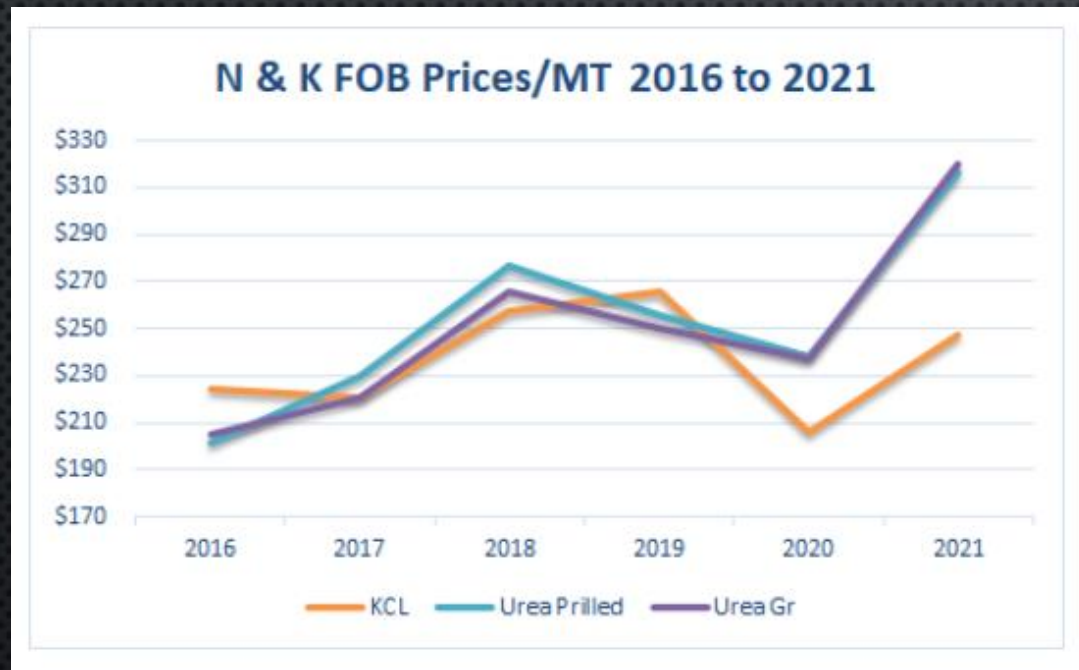


Source: <https://www.statista.com/statistics/236880/retail-price-of-bananas-in-the-united-states/>



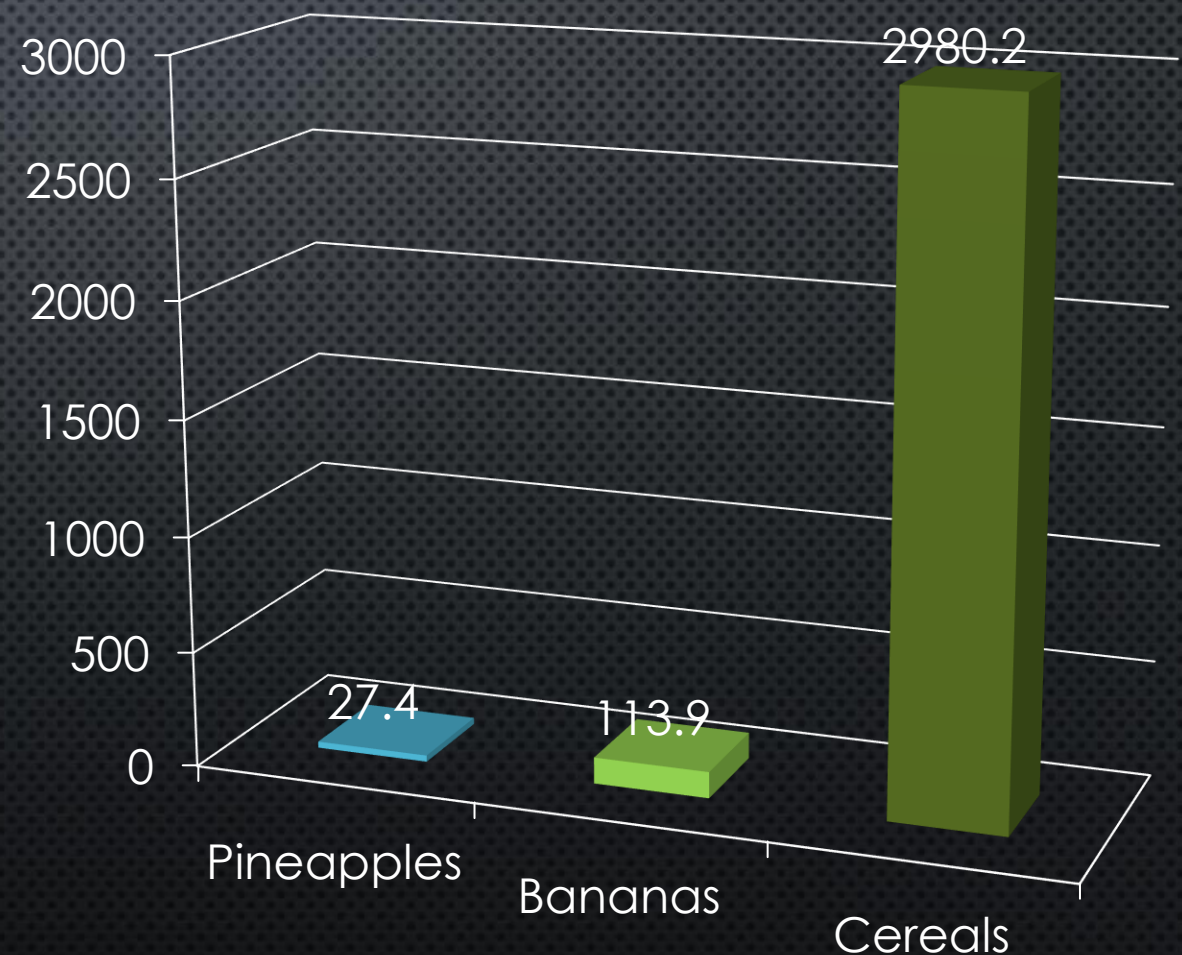
INCREASED PRODUCTION COSTS

- MEANWHILE, THE THREE MOST SIGNIFICANT COST CATEGORIES: LABOR, FERTILIZERS, AND PACKAGING MATERIALS CONTINUES TO INCREASE ALMOST YEARLY.
- LABOR WAGES IN MOST PRODUCTION COUNTRIES IN LATAM ARE SET BY THE GOVERNMENT.



PINEAPPLES AND BANANAS VS. CEREALS; VOLUME (MILLIONS OF MT), 2017

- Research into new alternative agrochemicals focus on the world's largest crops.
- Bananas and Pineapples do not represent a relevant “market” for new technology



Applications for new active substances

Year	2011	2012	2013	2014	2015	2016	2017	2018
New active substance applications	4	8	12	6	15	10	4	10

Information from the summary reports from the Standing Committee on Plants, Animals, Food and Feed.

MRL'S LANDSCAPE

DIFFERENCE BETWEEN AN MRL AND A TOLERANCE

- EUROPE: IF AN ACTIVE INGREDIENT IS NOT ASSIGNED A SPECIFIC MRL, EUROPEAN LEGISLATION ESTABLISHES A DEFAULT LEVEL OF 0.01 MG/KG [ART. 18(1)(B) OF REG. EC No. 396/2005]
- UNITED STATES: IF AN ACTIVE INGREDIENT DOES NOT HAVE A TOLERANCE AND THE PESTICIDE IS APPLIED TO THE CROP, THE RESULTING FRESH PRODUCT CAN BE CONSIDERED AN “ADULTERATED PRODUCT”. [SEC 402 (21 USC 342)]

CONFORMANCE WITH EU MRLS



Fruit Residue Analysis. Dole Europe. Period: 2015-2020

Source	Total Samples	Over EU MRL	% Over
Colombia	1,820	0	0.0%
Costa Rica	2,548	8	0.3%
Ecuador	2,075	12	0.6%
Total	6,443	20	0.3%

Note: Results reflect pulp and peel analysis.
When pulp is analyzed alone, no residues are found.

CONFORMANCE WITH EU MRLS



Fruit Residue Analysis. European Union Year: 2019

Product	Total Samples	Below LOQ	Between LOQ - MRL	Above MRL
Bananas	908	28.5%	71.4%	0.1%
Pineapples	473	41.4%	51.4%	7.2%
Tropical Fruit	6,252	54.6%	35.3%	10.0%
Fruits & Nuts	30,257	36.6%	59.2%	4.2%
Vegetables	35,208	53.8%	41.3%	4.8%

MRL/TOLERANCES EVOLVING REQUIREMENTS

- MAIN “FOOD SAFETY” ISSUES ARE RELATED TO MRLs; SIGNIFICANT NUMBER ARE AT DETECTION LIMIT.
- MORE POLITICS THAN SCIENCE: “PRECAUTIONARY PRINCIPLE” IN EUROPE
- USA REGULATION UNDER BIDEN ADMINISTRATION ARE TARGETING A NUMBER OF ACTIVE SUBSTANCES FOR CPP's.
- RETAILERS ARE ALSO INCREASINGLY SUSPICIOUS OF MULTIPLE RESIDUES
- CERTIFICATION BODIES, ALSO GOING BEYOND MRL's

GOING BEYOND.....

- BOTH, MEMBER STATES AS WELL AS PRIVATE STAKEHOLDERS ARE GOING BEYOND REGULATIONS AND ACCELERATING THE PROCESS.....

Danish supermarkets Coop, Aldi and Lidl demand their suppliers go beyond legal requirements on maximum pesticide levels in response to mounting consumer concern over the issue.

ENVIRONMENT AUGUST 22, 2019 / 12:58 PM / 4 MONTHS AGO

French mayors ban glyphosate weedkiller, defying government

The new Flemish legislation

"The use of adhesive labels placed directly on vegetables and fruits shall be prohibited unless the information on the label is functional or required by law" (**Regulation on the sustainable management of material cycles and waste [VLAREMA] - 7th package of amendments**)

Notified in August 2018 under TRIS notification procedure (Directive 2015/1535) under number 2018/407/B.

MRL'S IMPACT ON IPM OF BANANA

INSECT CONTROL - BAGGING:

- THE FUNCTIONALITY OF THE MOLECULES ARE AS FOLLOWS:
 - PYRIPROXIFÉN → APHIDS, SCALES, MEALYBUGS
 - IMIDACLOPRID → APHIDS, SCALES, MEALYBUGS
 - CHLORPYRIFOS USA OK → APHIDS, SCALES, MEALYBUGS
 - BIFENTHRIN → COLASPIS, SCALES, THRIPS, APHIDS
 - BUPROFEZIN USA OK → MEALYBUGS, SCALES
 - ACETAMIPRID → UNDER REGISTRATION
- The table below shows potential production impacts of losing treated plastics treebags:

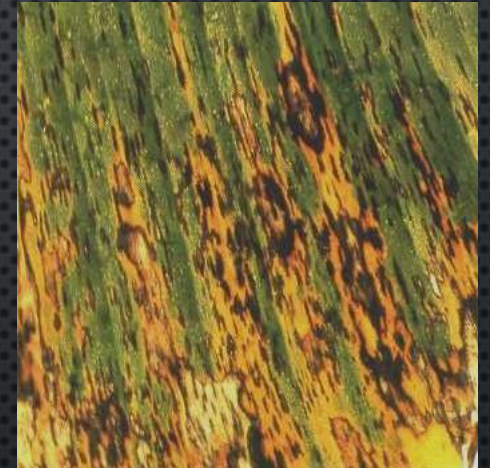
Expected Reduction in Productivity with untreated treebags:		
Guatemala	30-50%	Colaspis, mealybugs
Honduras	50-65%	Mealybugs, scales, aphids
Costa Rica	50-65%	Scale, mealybugs, aphids, Colaspis
Ecuador	50-75%	Red Rust, mealybugs, aphids, Colaspis

SIGATOKA (LEAF FUNGUS) CONTROL



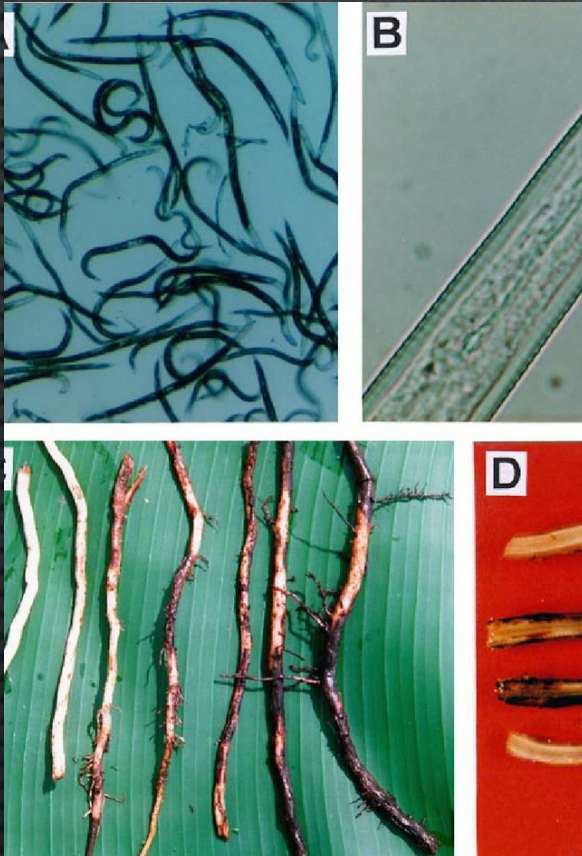
- FUNGICIDES ARE OF CONCERN REGARDING MRL REDUCTION BECAUSE THE NUMBER OF MOLECULES AT RISK:

- **CHOROTALONIL (BRAVO)** → EU/RAS 2020/21
- **DITHIOCARBAMATES (MANCOZEB)** → EU/RAS 2020/21
- FENPROPIMORPH → EU/RAS 2020
- DIFENOCONAZOLE → EU/RAS 2020
- EPOXYCONAZOLE → EU/RAS 2020
- TRIADIMENOL (SILVACUR) → EU/RAS 2019
- FLUAZINAM → EU/RAS 2020



- **LOWERING OF MRLs FOR THE CONTACT FUNGICIDES, WILL LEAVE THE INDUSTRY WITHOUT MULTISITE CONTACT FUNGICIDES**, THE BASIS FOR RESISTANCE SELECTION MANAGEMENT.
- RESISTANCE TO THE DISEASE WILL INCREASE, GIVEN THE FEW MOLECULES LEFT.

BURROWING NEMATODE CONTROL:



- NEMATOCIDES ARE THE THIRD GROUP OF CONCERN REGARDING MRL REDUCTION:
 - ETHOPROPHOS – (MOCAP) → EU 2020 /RAS
 - TERBUFOS - (FORATER, COUNTER) → EU/ 2020 RAS
 - CADUSAFOS – (RUGBY) → EU/ 2020 RAS
 - OXAMYL – (VYDATE) → EU/RAS INJECTION ONLY
 - FLUOPYRAM – (VERANGO) → ONLY REMAINING OPTION!!!
- THE FUNCTIONALITY OF THE MOLECULES ARE AS FOLLOWS:
 - NEMATODES → ALL OF THE ABOVE
 - WEEVILS → TERBUFOS, ETHOPROP
- IF WE LOSE NEMATOCIDES, NO WEEVIL PROTECTION AVAILABLE.
- SOLVIGO (SYNGENTA) AND AVEO (VALENT UNDER EVALUATION).

DOCUMENTED YIELD LOSSES. NO NEMATICIDE USE.

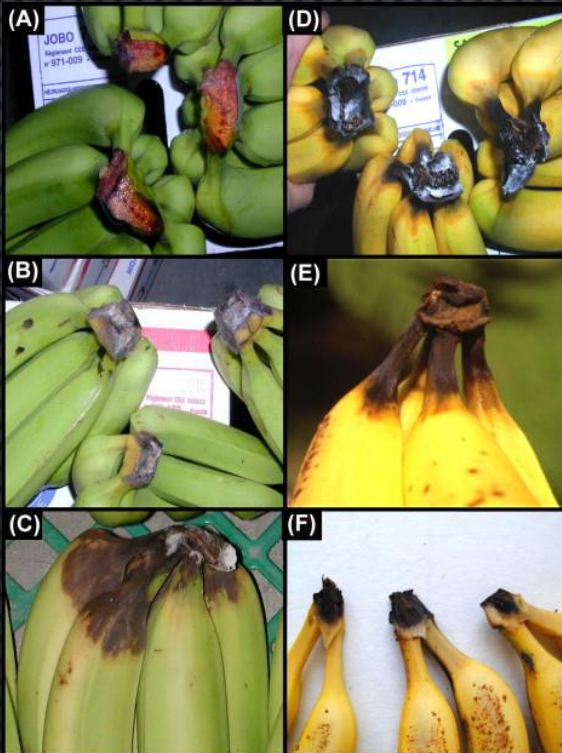


Damaged Banana Plant Roots

Country / Project #	Commercial Program Yield (MT/ha)	Untreated Control Yield (MT/ha)	% Yield Loss
Costa Rica - #217	70.9	30.3	(57.3)%
Costa Rica - #237	75.1	52.5	(30.1)%
Costa Rica - #238	76.4	39.9	(47.8)%
Costa Rica Avg.	74.1	40.9	(45.0)%
Honduras - #251	88.2	77.9	(11.7)%
Honduras - #350	89.1	80.4	(9.8)%
Honduras - #358	86.5	68.2	(21.2)%
Honduras Avg.	87.9	75.5	(14.2)%

Source: Dole Tropical Products, Research Department, Field Trials.

FRUIT ROT AND MOLD CONTROL (POST HARVEST FUNGICIDES)



- Imazalil → EU 2020 (April 2020 MRL at 0.01 ppm)
- Myclobutanil → EU 2021
- Thiabendazole → Good control requires mixing with Imazalil
- **Azoxystrobin → The only alternative left**

SOME EXAMPLES OF IMPACT:

Table 1.2 Examples of missing MRLs

Missing MRLs	Examples of reasons that MRLs may be missing in import markets
The market to which farmers export does not have an MRL in place for the pesticide/crop that they use/produce.	<ul style="list-style-type: none"> No MRLs for pesticide X have been established in Japan because pesticide X is not registered for use in Japan. No MRL for pesticide X/crop Y has been established in Japan because although Japanese farmers use pesticide X, they do not use it on crop Y or produce crop Y. A pesticide manufacturer has not applied for an import tolerance (MRL) to be set for a certain pesticide/crop combination in South Korea, because it is a specialty crop produced in small volumes which do not justify the expense of conducting the field trials and generating the data required to support the MRL application. A pesticide manufacturer has applied for an import tolerance (MRL) to be set for a certain pesticide/crop combination in Taiwan; however, the submitted application/dossier was deemed insufficient/unacceptable by the regulatory authority and rejected. Although there is a Codex MRL for this pesticide/crop combination, the importing regulatory authority has not adopted the Codex MRL or established its own MRL. Although an importing country generally adopts Codex MRLs, there is no Codex MRL for this pesticide/crop combination. In the absence of an MRL in place, the regulatory authority has not set a default level, implying a zero-residue tolerance for that pesticide, i.e., no trace residue levels are permitted on imported crops in that country.

Source: Compiled by USITC.

Table 1.3 Examples of low MRLs

Low MRLs	Examples of reasons that MRLs may be considered low in import markets
An import MRL faced by an exporter is lower than the MRL permitted in the home market.	<ul style="list-style-type: none"> A U.S. exporter faces an MRL of 2 parts per million (ppm) in Australia, while the MRL in the United States is 4 ppm.
An existing import MRL faced by an exporter is reduced to a lower level and this level is lower than the MRL permitted in the home market.	<ul style="list-style-type: none"> In the process of reviewing existing pesticide registrations, the regulator reviews data and recommends lowering the MRL from 5 ppm to 2 ppm. South Korea previously had adopted Codex MRLs but is developing a positive list system. As part of the process of establishing its own MRLs, South Korea reduces an MRL from 5ppm (under Codex) to 3 ppm. In the process of reviewing existing pesticide registrations, the EU does not renew a certain pesticide and revokes the existing 2 ppm MRL for that pesticide. This process results in a change in the MRL from 2 ppm to a default of 0.01 ppm.
An import MRL faced by an exporter is lower than or is changed to a lower level than an international standard like Codex.	<ul style="list-style-type: none"> A U.S. exporter faces a 3 ppm MRL in Japan, while the Codex MRL is 5 ppm.
An import MRL faced by an exporter is lower in one export market than in another export market.	<ul style="list-style-type: none"> A U.S. exporter ships apples to the EU and Japan. As a result of these markets' separate processes for establishing MRLs, the MRL for a certain pesticide used on apples is 3 ppm in the EU and 2 ppm in Japan.
An MRL faced by an exporter is considered by farmers to be too low to use the pesticide according to the pesticide label approved for use in the home market.	<ul style="list-style-type: none"> A U.S. grower complies with a 5 ppm MRL in its home market. However, the same MRL in its main export market is 3 ppm. The U.S. grower is able to meet this lower MRL by adjusting use of the pesticide so that residue levels meet the 3 ppm limit. Later, the MRL in the export market is reviewed and lowered to a default of 0.01 ppm (the limit of determination/quantification). The U.S. grower is unable to adjust pesticide use to meet this extremely low MRL. However, a grower in a different country facing less pest pressure may still be able to meet this default level MRL.

DIFFERENT STANDARDS:

Table 5.2 MRLs for key pesticides used in the banana industry (ppm)

Active ingredient	Pesticide type	Codex	Canada	United States	EU	Recent Changes (EU)
Buprofezin	Insecticide	0.3	0.3	0.2	0.01	In 2017, approval was amended to include only use on non-edible crops. In January 2019, MRLs for buprofezin on most edible crops defaulted to 0.01 ppm (previous level was 0.5 ppm).
Chlorpyrifos	Insecticide	2	0.1	0.1	0.01	Approval not renewed as of December 2019. EU member states' grace periods ended by April 2020, after which MRLs defaulted to 0.01 ppm (previous level was 4 ppm).
Chlorothalonil	Fungicide	15	0.1	0.5	15	Approval not renewed as of March 2019. Grace period ends May 2020—after this, MRL will default to 0.01 ppm.
Mancozeb	Fungicide	2	0.1	2	2	Next review by January 2021.
Imazalil	Fungicide	3	0.01	3	2	Next review by December 2024.

Source: Bryant Christie Global, Pesticide MRLs database for active substances shown (accessed December 20, 2019); European Commission, EU Pesticides Database for active substances shown (accessed January 22, 2020); WTO SPS Committee, "Summary of the Meeting of 21-22 March 2019," June 27, 2019.

The Codex Alimentarius has become a reference, it is not used or reconized by local authorities.

COSTS OF AN MRL VIOLATION

- EXCEEDING MRLs SET BY REGULATORS IN IMPORT MARKETS IS CONSIDERED AN MRL VIOLATION.
- ADDRESSING VIOLATIONS IMPOSES HIGH COSTS ALONG THE SUPPLY CHAIN, PARTICULARLY FOR FARMERS AND EXPORTERS. VIOLATIONS CAN OCCUR WHEN ROUTINE EFFORTS TO COMPLY WITH MRLs, ARE UNSUCCESSFUL.
- THESE COSTS INCLUDE REVENUE LOSS FROM A REJECTED SHIPMENT THAT CANNOT BE SOLD IN ITS ORIGINAL MARKET AND IS REDIRECTED OR DESTROYED INSTEAD.
- INCREASED TESTING OF COMMODITIES MANDATED BY THE IMPORT MARKET.
- REPUTATIONAL IMPACTS CAN AFFECT SALES AND MARKET ACCESS.
- SOMETIMES PRODUCTS FROM VIOLATING EXPORTERS, OR EVEN THE WHOLE SECTOR, ARE BANNED UNTIL CORRECTIVE ACTIONS ARE TAKEN.

The image features a bright yellow background with several ripe, yellow bananas scattered across it. The bananas are in various orientations, some curved and some straight. Overlaid on this background are four phrases in a bold, dark blue, sans-serif font. The phrases are: 'Muchas Gracias!' in the upper left, 'Thank you!' in the center right, 'Arigato gozaimasu!' in the lower left, and 'Danke Schön!' in the lower center. The bananas cast soft shadows on the yellow surface.

**Muchas
Gracias!**

Thank you!

**Arigato
gozaimasu!**

Danke Schön!