

Sustaining quality supplies in an increasingly precarious production context





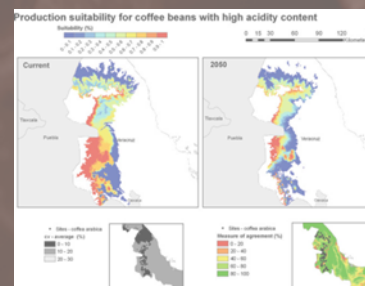
What are we talking about?

Strong Demand



Supply-side Challenges

Climate change
Genetic constriction



Paucity of Research
lightweight scientific tool box to fix it





Enter Agricultural Research and Development



An **international network** of coffee research institutes, centers, and programs **working together** to **grow, protect** and **enhance supplies** of quality coffee while **improving** the **livelihood** of the families who produce it

Managed by the Norman Borlaug Institute for International Agriculture at Texas A&M University

Funded and directed by the global coffee industry



Who's driving the agenda?



And others....



What are we doing?



Consumers

Higher quality, more choice and greater taste differentiation leading to higher consumption

The Global Coffee Industry

Supplies of quality coffees grow with greater product differentiation potential

Producers

Higher yields and quality increase income and improve livelihoods

Get the new varieties and accompanying technologies into the hands of the producer

Making the new technology affordable and easily adoptable

Rapid gains through variety performance comparison trials in all origin countries

Stacking the good genes into strong and desirable genetic stocks for quick and easy breeding at origin

New and needed genes for climate change, quality attributes, productivity and pest resistance

Impact
now

Accelerated Productivity Enhancement

Extension, credit, fertilizers, seed, field demonstrations...

2-5
years

Development of 'seed' multiplication technology

Dissemination of new technologies in producing countries...

2-10
years

Multi-location variety trials

Scientific information for climate change and quality research

10-15
years

Development of new breeding populations

Climate change tolerant, high quality attributes, CBB, CBD, rust...

Forever

Germplasm collection, screening and preservation

Conserving coffee diversity

National
and
international
breeding
programs



Focus on genetics

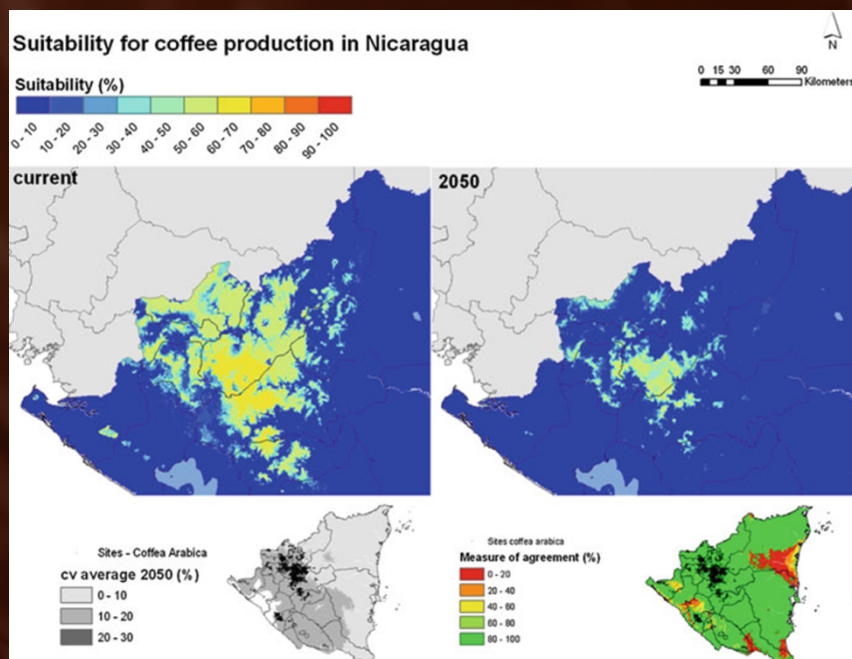
- **Proven returns on investment for all crop species**
- **Low hanging fruit**
- **Lots of highly advanced technology from other crops**
- **Very little done in coffee**
- **Genetics doesn't mean GMO**



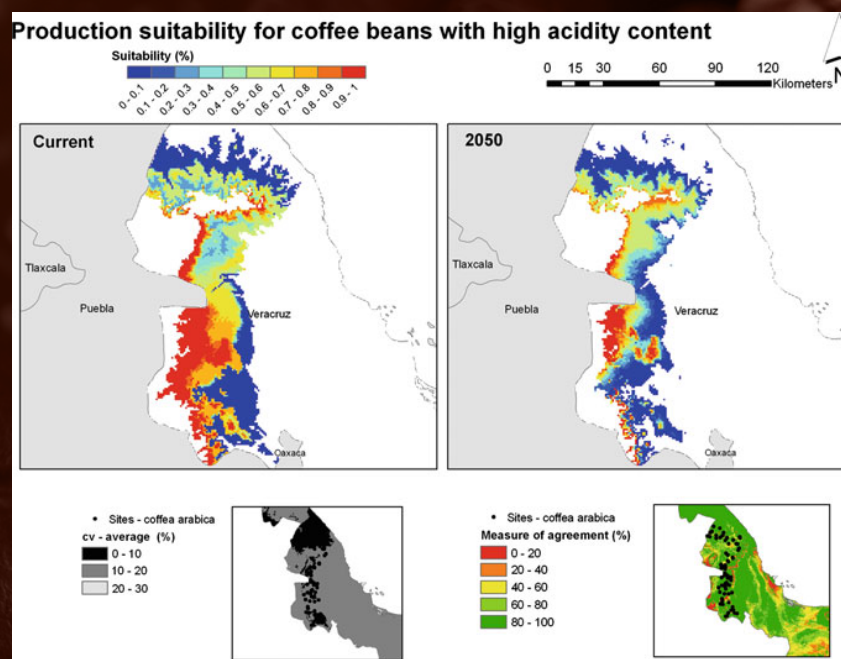
Why? An example....

Effects of Climate Change

On production



On quality





How and why higher temperatures hurt quality and productivity

Average temperature 23°C

- rapid cherry fill
- less time to accumulate volatile compounds
- lower density
- lower acidity and flavor attributes

- flower abortion
- cherry drop
- higher insect/disease pressures
- system overload





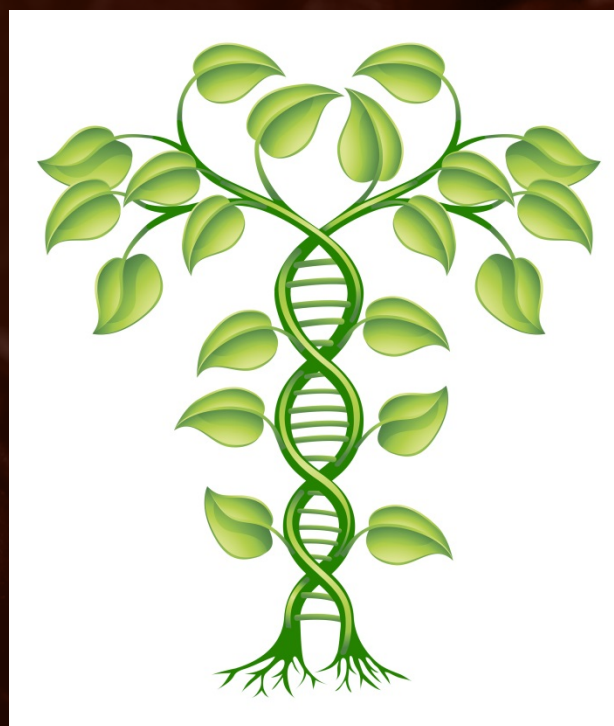
What to do?

Change environment



OR

Change the genetics





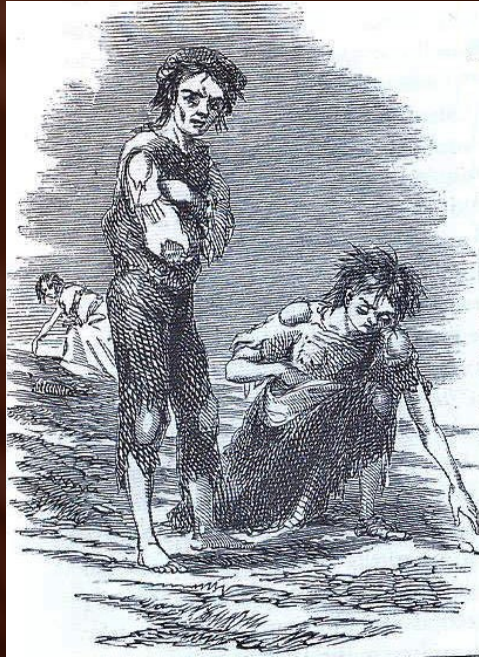
Genetic Diversity is the key but... in coffee it's constricted



**All the varieties used today come from just
a handful of parental strains from Ethiopia**



No diversity, no way out...



Irish potato famine

French wine blight



Mexican agave crisis



Coffee Leaf Rust in Central America





Big problem and expensive

Coffee Rust Response Estimates

| | Total Number Farmers | Farmers affected | Total Number Hectares | Hectares affected ¹ | % coffee area affected | % Hectares for renovation | Cost of Spraying one year | Cost of seedlings/grafts |
|--------------|----------------------|------------------|-----------------------|--------------------------------|------------------------|---------------------------|---------------------------|--------------------------|
| Guatemala | 90,000 | 75,000 | 275,000 | 193,000 | 70 | 20 | \$ 57,900,000 | \$ 115,800,000 |
| Honduras | 112,000 | 100,000 | 280,000 | 70,000 | 25 | 30 | \$ 21,000,000 | \$ 42,000,000 |
| Nicaragua | 45,000 | 32,000 | 125,800 | 46,800 | 37 | 25 | \$ 14,040,000 | \$ 28,080,000 |
| Costa Rica | 52,700 | 14,000 | 94,000 | 60,000 | 64 | 30 | \$ 18,000,000 | \$ 36,000,000 |
| El Salvador | 17,000 | 14,000 | 152,000 | 112,000 | 74 | 40 | \$ 33,600,000 | \$ 67,200,000 |
| Panama | 7,600 | 3,000 | 20,000 | 4,800 | 24 | 40 | \$ 1,440,000 | \$ 2,880,000 |
| Jamaica | 20,700 | 3,600 | 3,000 | 840 | 28 | 45 | \$ 252,000 | \$ 504,000 |
| D.R. | 50,000 | 40,500 | 131,000 | 105,000 | 80 | 45 | \$ 31,500,000 | \$ 63,000,000 |
| TOTAL | 395,000 | 282,100 | 1,080,800 | 592,440 | 50 | 34 | \$ 177,732,000 | \$ 355,464,000 |



It Keeps happening & getting worse

- **Outbreak of in Central America in 1980s**
- **Outbreak of rust in Colombia in 2008**
- **Increase in size and frequency with Climate Change**

It doesn't have to happen!



What are we doing?

**Emergency
Coffee Rust
Summit**

April 18th and 19th 2013
Guatemala City, Guatemala



PROMECAFE ♥ WCR

Coffee Industry



USAID



\$4.5M Rust Research Project
Central America, Caribbean
and Peru





Who's supporting it in the coffee industry?

- Allegro Coffee
- Community Coffee
- Counter Culture Coffee
- ECOM Trading
- Farmer Brothers/CBI
- Fres-co Systems USA
- Green Mountain Coffee
- Illy
- InterAmerican Coffee
- La Marzocco
- Mars beverages
- Nouva Simonelli
- OLAM Americas
- Peet's Coffee & Tea
- Royal Cup
- SCAA
- S&D Coffee Roasters
- Starbucks
- Terarosa
- The Roaster's Guild,
- The J.M. Smucker Co.,
- Toa Coffee Ltd.
- Union Hand Roasted Coffee,
- Wilbur Curtis

1\$ Private matched by 1\$ USAID



Rust Project Components

Variety Intelligence: Farmer investment decision



Which one for best return?

- Rust Resistance
- Yielding ability by location and system
- Other resistances
- Cup quality analyses performed by industry
- Sources of seed



Rust Project Components

**Seed and seedling
multiplication
support**



- **Coffee Tissue culture labs**
- **Micro-cuttings operations**
- **Farmer seed certification**



Rust project components

Central American, Peru and Caribbean Coffee Variety Improvement program

- **Variety Trials**
- **Rust breeding program**
- **Genomic selection**





Distributing them in comparative trials in each PROMECAFE Country

Seeds of World's best 30 varieties



3 locations in 9 countries

Texas
USDA



Disinfection and *in vitro* germination

Sterile packaging of *in vitro* new plantlets



In Vitro
(sterile)

Crossing border

Participating
countries



Reception in countries of sterile *in vitro* plantlets



Transplanting in nurseries (like classical seedlings)



Opening in partners facilities



Rust project components

Best Agronomic Practices to control rust



Lots of advice but what can a farmer be certain of?



Rust Project Components

New bio-control research holds promise



- gives increased resistance or tolerance to both abiotic and biotic stresses – acts as a ‘bodyguard’
- Collect and test from indigenous arabica forests



Rust Project components

Capacity Building: Stronger institutions

- **4 PhDs trained from the PROMECAFE countries**
 - Coffee Economics
 - Coffee Pathology
 - Coffee Breeding
 - Coffee Genetics
- **Strengthened PROMECAFE**
 - Regional Coffee Sector Policy Analysis
 - R&D planning and management
- **Strengthened institutions: CATIE, ANACAFE, IHCAFE, ICAFE, PROCAFE, ...**



Sustaining it: How to keep it growing

www.worldcoffeeresearch.org

- **Industry cooperation is only way**
- **Governments broke**
- **Producers don't have funds**
- **Project goes but coffee industry-WCR stay**



Thanks!