Westrock Coffee Analysis

Capstone Presentation

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11/10/2016

Westrock Coffee

Field officers manage and train coffee farmers across the world

- Teach courses to help produce more yield and better quality coffee beans
- Go to farms to quality course implementation by the farmer

Main Questions

Question 1: Which courses (when adopted by a farmer) boost the farmer's coffee yield the most?

Question 2: How do the field officer ratings differ? Are some officers more lenient or more stringent?

What does the data look like?

Features:

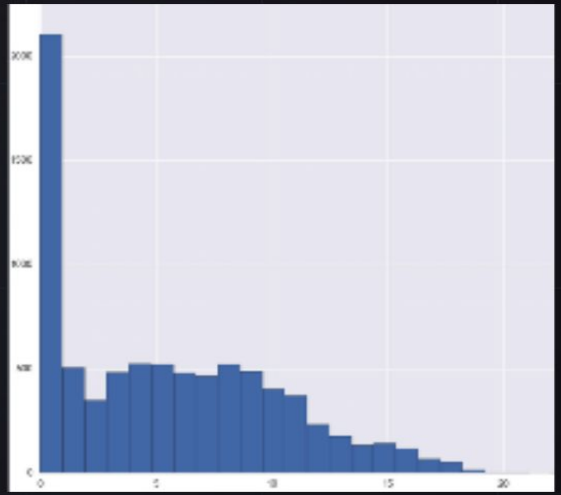
- Station: Region
- Trees Producing
- Staff: Field Officer
- 2015 Yield / 2016 Yield
- Household ID: ID of farmer
- Trees: Number of trees on farm
- Group ID: ID of group of farmers
- Courses: Courses that farmer took
- Adoption: % that farmer applies courses
- Attendance: % that farmer attends courses

Courses Offered:

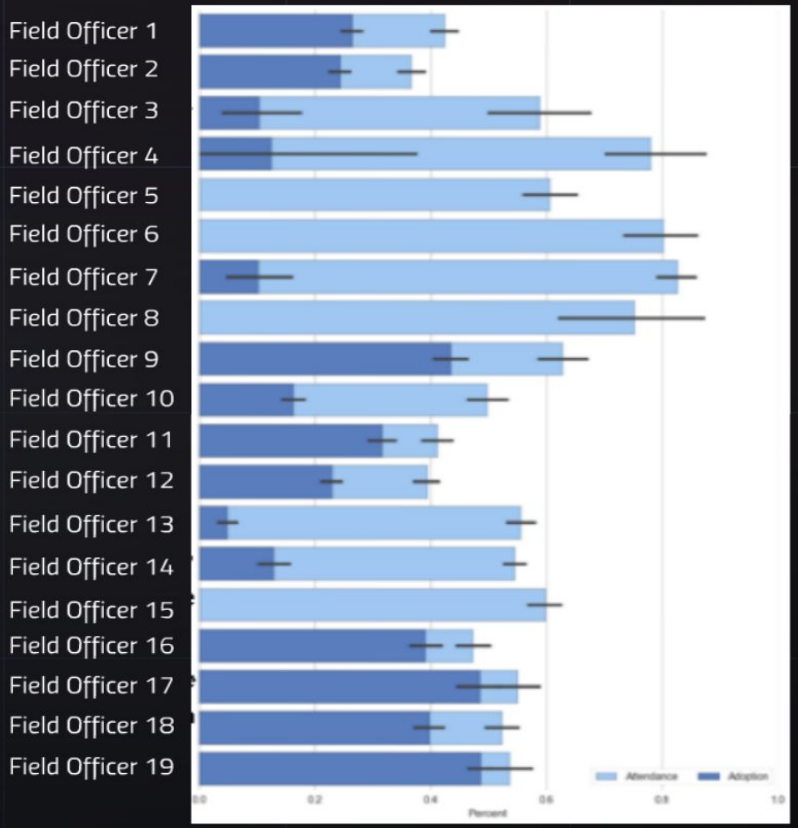
- Harvesting Best Practices
- Adapting to Climate Change
- Community Coffee Collection
- Weed Control; Erosion Control
- Integration Pest Management
- Rainforest Alliance Certification
- Climate Change; Post Harvesting
- Transparent Supply Chain & Pricing
- Farm Protection; Shade Managment
- Transparency Standards & Group Goal Setting
- Nutrition & Mulching; Pruning & Rejuvenation
- Mulching; Composting; Farm Business Principle

Co-occuring courses

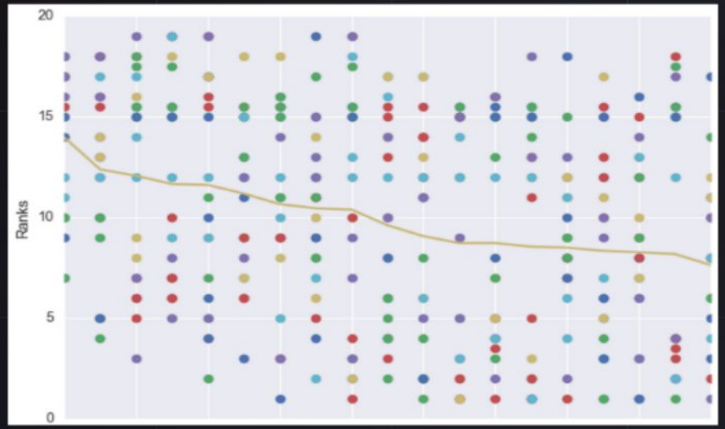
Course Frequency



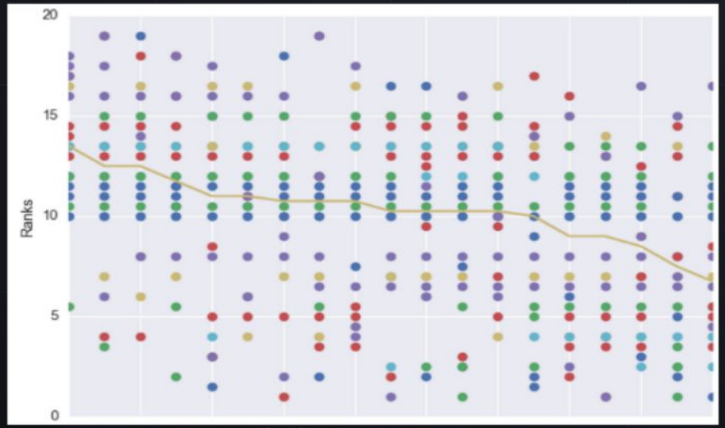
The average attendance rate versus the average adoption rate for each field officer



Mean features



Median features



Field Officer 1 Field Officer 2 Field Officer 3 Field Officer 4 Field Officer 5 Field Officer 6 Field Officer 7 Field Officer 8 Field Officer 9 Field Officer 10 Field Officer 11 Field Officer 12 Field Officer 13 Field Officer 14 Field Officer 15 Field Officer 16 Field Officer 17 Field Officer 18 Field Officer 19

- ('Rank', 'Attendance')
- ('Rank', 'Adoption')
- ('Rank', 'Trees')
- ('Rank', 'Trees_Producing')
- ('Rank', 'Avg. Yield')
- ('Rank', 'Shade Management')
- ('Rank', 'Adapting to Climate Change')
- ('Rank', 'Farm Protection (Ecosystem and Biodiversity Conservation)')
- ('Rank', 'Composting')
- ('Rank', 'Integrated Pest Management')
- ('Rank', 'Harvesting Best Practices')
- ('Rank', 'Erosion Control')
- ('Rank', 'Community Coffee Collection')
- ('Rank', 'Farm Business Principles')
- ('Rank', 'Pruning & Rejuvenation')
- ('Rank', 'Post Harvesting')
- ('Rank', 'Mulching')
- ('Rank', 'Transparent Supply Chain & Pricing')
- ('Rank', 'Integrated Pest Management, 2 or more times')
- ('Rank', 'Harvesting Best Practices, 2 or more times')
- ('Rank', '2015')
- ('Rank', '2016')
- Average

Course Analysis

2015/2016 Average Yield regressed on available features:

Indicator Variables for each Station, Field Officer, Group ID, Courses taken once, and Courses taken 2 or more times

- K-Fold Cross Validation
- Backwards Stepwise Selection
- Focussed on significant features

Deliverables

The intercept represents baseline yield of 231. The adoption coefficient is 28, representing an increase of 28 times the rate for a particular farmer

Four courses had a significant positive impact on average yield:

- Shade Managment 2 or more times = 593 x rate - 244
- Composting = 360 x rate - 49
- Weed Control = 268 x rate - 12
- Integrated Pest Management
  - 1 time = 205 x rate + 26
  - 2 or more times = 301 x rate - 100

For example, a farmer takes Weed Control with an adoption rate of 50%

Expected Amount of yield = 231 + (268*50%) + (28 * 50%) - 12

= 367 yield

Thanks for watching

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