

Chocolate Modeling

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As a first pass, I fit a simple linear regression predicting ratings. I don't expect it to do well, but it will provide a useful baseline. I create a "sentiment" feature by using `sentimentr` to compute sentiment for each phrase used to describe each chocolate, then summing the total for each chocolate bar. Positive values mean higher sentiment. I don't simply compute sentiments for individual words because that would miscode negations (e.g., "not good").

It might have been better to extract this complex transformation to a function instead of jamming it into a recipe.

```
library(tidymodels)
library(tidyverse)
source(here::here("utils.R"))
set.seed(12345)

chocolate_raw <- readRDS(here::here("data", "chocolate.Rds"))
chocolate_raw[["sentiment"]] <- NA
chocolate <- initial_split(chocolate_raw)
train <- training(chocolate)
test <- testing(chocolate)
lin_spec <- linear_reg()
lin_rec <- recipe(train,
  formula = rating ~ .,
  vars = NULL
) |>
  # step_select(c(
  # rating, company_location, country_of_bean_origin,
  # review_date, cocoa_percent, beans, cocoa_butter, lecithin, sugar, salt, nonsugar_sweetener, vanilla
  # )) |>
  step_other(company_location, country_of_bean_origin) |>
  step_dummy(c(all_nominal_predictors())) |>
  step_novel(all_nominal_predictors()) |>
  # step_date(review_date, keep_original_cols = FALSE) |>
  update_role(rating, new_role = "outcome") |>
  update_role(company_location, country_of_bean_origin, review_date, cocoa_percent, cocoa_butter, beans,
  update_role(ref, company_manufacturer, ingredients, specific_bean_origin_or_bar_name,
    starts_with("characteristic"),
    new_role = "id"
```

```

) |>
step_mutate(
  sentiment = (across(starts_with("characteristic"), ~ str_remove_all(.x, "\\.") |>
    sentimentr::get_sentences() |>
    sentimentr::sentiment() |>
    pull("sentiment")) |>
    rowSums() |>
    unname()),
  across(where(is.logical), as.integer)
)

lin_wflow <- workflow(lin_rec, lin_spec)

```

I define a function (in `utils.R`) to round model predictions to the nearest increment on the scale. This violates the OLS assumptions, but this model is only intended as a reference. I use this function to develop a custom metric, `interval_error`, that measures each raw prediction's deviation from the true rating, rounded to the nearest increment, in units of the increment (0.25). For example, a prediction of 3.27 and a true rating of 2.5 calibrate to an interval error of 3 because $|2.5 - 3.27|$ rounded to the nearest fourth and multiplied by 4 (the inverse of the increment) is 3. Estimates below the scale's minimum are rounded up to it, and those above the maximum are rounded down to it. Stated mathematically, the average interval error is:

$$\text{AIE} = \frac{1}{n} \sum_{i=1}^n \min(\max(|\frac{1}{\text{interval}} y_i - \lfloor \hat{y}_i + \frac{1}{2} \rfloor|, \min(y)), \max(y))$$

where $\lfloor \cdot \rfloor$ designates the floor function. (See [here](#)) for an explanation of the formula).

Using this approach, mean absolute error is below one and a half increments - better than I expected. RMSE is somewhat higher, suggesting some errors are disproportionately large. The average absolute error is equal to about 1.3 intervals.

```

chocolate_metrics <- metric_set(mae, rmse, interval_error)
baked <- prep(lin_rec) |>
  bake(train)
lin_model <- fit(lin_wflow, train)
tidy(lin_model)

```

term	estimate	std.error	statistic	p.value
(Intercept)	0.9404594	5.6716293	0.1658182	0.8683179
review_date	0.0011949	0.0028205	0.4236526	0.6718678
cocoa_percent	-0.0079457	0.0019008	-4.1801220	0.0000305
beans	0.3257450	0.1371720	2.3747199	0.0176623
cocoa_butter	0.0428686	0.0229946	1.8642917	0.0624368
lecithin	-0.0623157	0.0286164	-2.1776187	0.0295587
sugar	0.0724047	0.1396395	0.5185114	0.6041627
salt	-0.0287362	0.0931465	-0.3085056	0.7577319
nonsugar_sweetener	-0.1106388	0.1611097	-0.6867296	0.4923380
vanilla	-0.1719745	0.0323658	-5.3134654	0.0000001

term	estimate	std.error	statistic	p.value
sentiment	0.1554823	0.0201273	7.7249376	0.0000000
company_location_France	0.0850202	0.0546501	1.5557200	0.1199434
company_location_U.K.	-0.1765888	0.0568180	-3.1079732	0.0019120
company_location_U.S.A.	-0.0940694	0.0397907	-2.3641051	0.0181751
company_location_other	-0.0743240	0.0408385	-1.8199518	0.0689256
country_of_bean_origin_Dominican.Republic	0.1419636	0.0524912	2.7045203	0.0069021
country_of_bean_origin_Ecuador	0.1010171	0.0526336	1.9192533	0.0551038
country_of_bean_origin_Madagascar	0.2091296	0.0538583	3.8829578	0.0001068
country_of_bean_origin_Peru	0.1396470	0.0524977	2.6600612	0.0078792
country_of_bean_origin_Venezuela	0.1712217	0.0508126	3.3696713	0.0007678
country_of_bean_origin_other	0.1127894	0.0438530	2.5719873	0.0101880

```
lin_preds <- augment(lin_model, new_data = train)
lin_preds[[".pred"]] <- fit_to_scale(lin_preds[[".pred"]], min = 1, max = 4, increment = .25)
chocolate_metrics(lin_preds, truth = rating, estimate = .pred)
```

.metric	.estimator	.estimate
mae	standard	0.3292040
rmse	standard	0.4218748
interval_error	standard	1.3168160

It seems the biggest errors are for the very worst chocolate.

```
range(lin_preds[[".pred"]])
```

```
[1] 2.25 3.75
```

```
arrange(lin_preds, -abs(.pred - rating)) |>
  head() |>
  select(company_manufacturer, specific_bean_origin_or_bar_name, .pred, rating)
```

company_manufacturer	specific_bean_origin_or_bar_name	.pred	rating
Neuhaus (Callebaut)	Dark	3.00	1.0
Callebaut	Baking	2.75	1.0
Cote d' Or (Kraft)	Sensations Intense	2.75	1.0
Machu Picchu Trading Co.	Peru	3.00	1.5
Cacaoyere (Ecuadoriana)	Pichincha	3.00	1.5
Middlebury	Houseblend	2.75	1.5

The most common words pertain to flavors, not sentiments. These might be useful as categorical features

```
select(train, starts_with("characteristic")) |>
  unlist(use.names = FALSE) |>
  table_head(.n = 200) |>
  vec2DF()
```

Next, I try a random forest, reasoning that the relatively large number of predictors and likelihood of nonlinear associations suit it well for these data.

I use 10-fold cross validation to select the `mtry` and `min_n` parameters.

```
== Workflow [trained] =====
Preprocessor: Recipe
Model: rand_forest()

-- Preprocessor -----
4 Recipe Steps

* step_other()
* step_dummy()
```

```

* step_novel()
* step_mutate()

-- Model -----
Ranger result

Call:
ranger::ranger(x = maybe_data_frame(x), y = y, mtry = min_cols(~11L,      x), num.trees = ~400, min.no

Type:                Regression
Number of trees:      400
Sample size:          1897
Number of independent variables: 20
Mtry:                 11
Target node size:     2
Variable importance mode: none
Splitrule:            variance
OOB prediction error (MSE): 0.1695047
R squared (OOB):      0.1423659

rf_preds <- predict(rf_model, new_data = train)

```

These predictions have a much higher range. MAE and RMSE are less than half what they were in regression

```

rf_preds <- augment(rf_model, new_data = train)
rf_preds[[".pred"]] <- fit_to_scale(rf_preds[[".pred"]], min = 1, max = 4, increment = .25)
chocolate_metrics(rf_preds, truth = rating, estimate = .pred)

```

.metric	.estimator	.estimate
mae	standard	0.1324460
rmse	standard	0.1989197
interval_error	standard	0.5297839

I'm concerned about overfitting, so I also try boosting, which is less prone to overfitting.

```

boost_spec <- boost_tree(
  mode = "regression", learn_rate = tune(),
  mtry = tune(),
  min_n = tune(), tree_depth = 15, sample_size = 1
)

boost_wf <- workflow(lin_rec, boost_spec)
tuning_grid <- grid_regular(
  mtry(range = c(mtry_start - 2, mtry_start + 4)),
  learn_rate(),
  min_n()
)

```

```
tune_res <- tune_grid(boost_wf, grid = tuning_grid, resamples = folds, metrics = metric_set(interval_error),
boost_wf <- finalize_workflow(boost_wf, select_best(tune_res, "interval_error"))
boost_model <- fit(boost_wf, data = train)
boost_model
```

```
== Workflow [trained] =====
Preprocessor: Recipe
Model: boost_tree()
```

```
-- Preprocessor -----
4 Recipe Steps
```

```
* step_other()
* step_dummy()
* step_novel()
* step_mutate()
```

```
-- Model -----
```

```
#### xgb.Booster
```

```
raw: 30.3 Kb
```

```
call:
```

```
  xgboost::xgb.train(params = list(eta = 0.1, max_depth = 15, gamma = 0,
    colsample_bytree = 1, colsample_bynode = 0.25, min_child_weight = 2L,
    subsample = 1, objective = "reg:squarederror"), data = x$data,
    nrounds = 15, watchlist = x$watchlist, verbose = 0, nthread = 1)
```

```
params (as set within xgb.train):
```

```
  eta = "0.1", max_depth = "15", gamma = "0", colsample_bytree = "1", colsample_bynode = "0.25", min_child_weight = "2L",
```

```
xgb.attributes:
```

```
  niter
```

```
callbacks:
```

```
  cb.evaluation.log()
```

```
# of features: 20
```

```
niter: 15
```

```
nfeatures : 20
```

```
evaluation_log:
```

```
  iter training_rmse
```

```
    1      2.469393
```

```
    2      2.230381
```

```
---
```

```
    14      0.739083
```

```
    15      0.684801
```

```
boost_preds <- predict(boost_model, new_data = train)
```

The boosted model does terribly compared to the others, with far greater errors.

```
boost_preds <- augment(boost_model, new_data = train)
```

```
boost_preds[[".pred"]] <- fit_to_scale(boost_preds[[".pred"]], min = 1, max = 4, increment = .25)
```

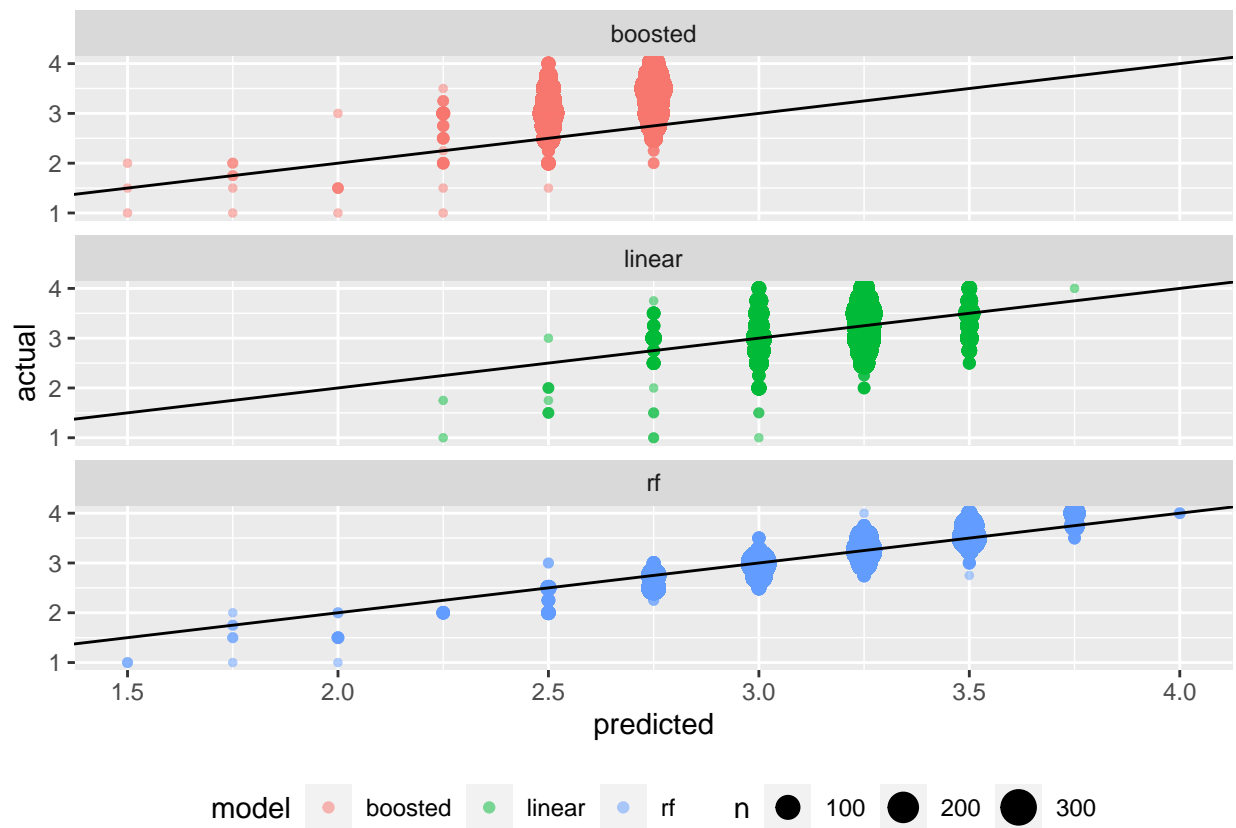
```
chocolate_metrics(boost_preds, truth = rating, estimate = .pred)
```

.metric	.estimator	.estimate
mae	standard	0.5843437
rmse	standard	0.6822066
interval_error	standard	2.3373748

Comparison

This plot clarifies the pattern

```
overall <- tibble(
  actual = train[["rating"]], linear = lin_preds[[".pred"]],
  rf = rf_preds[[".pred"]], boosted = boost_preds[[".pred"]]
)
fitted_actual_plot(overall, -actual)
```



Evaluation

Now, to predict on the test set. The boosted model does as terribly as before. Linear regression performs about the same as the random forest. The random forest's better performance on the training set was probably a result of overfitting.

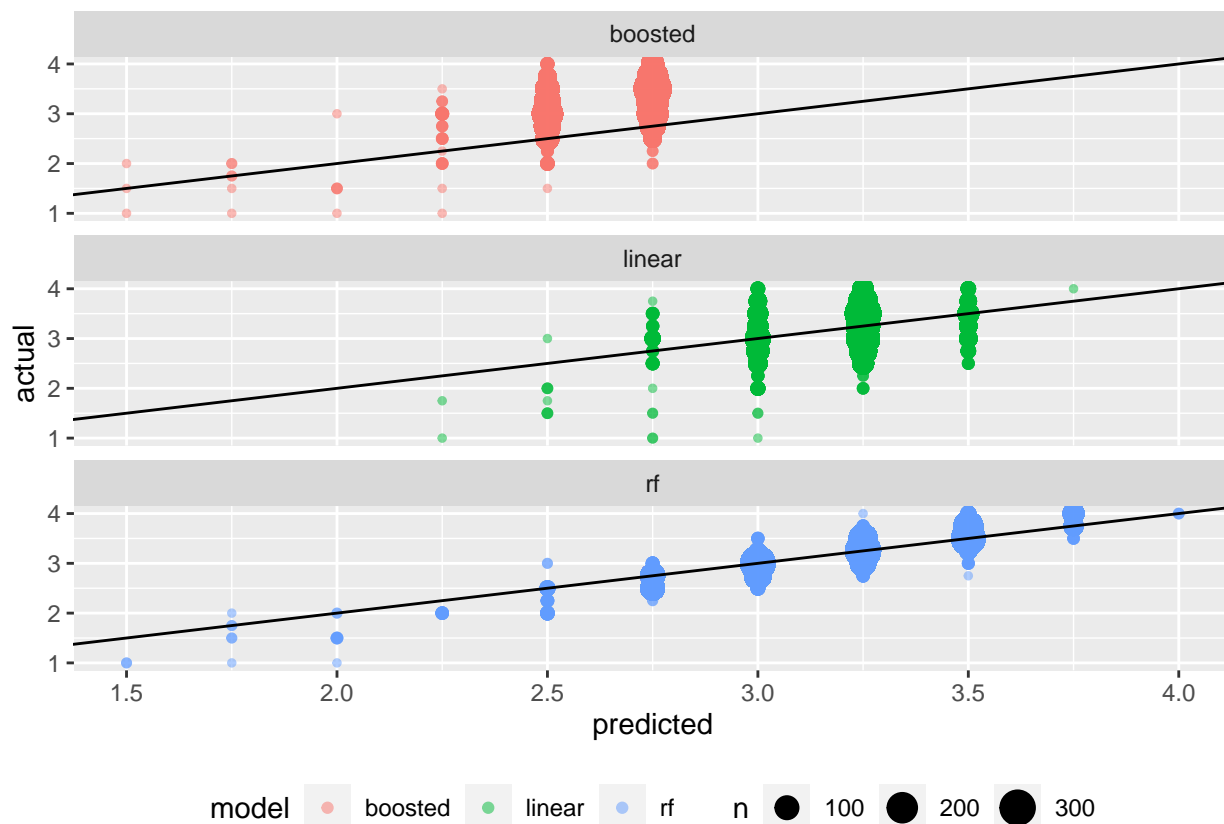
```
lin_test <- test_preds(lin_model, test)
rf_test <- test_preds(rf_model, test)
boost_test <- test_preds(boost_model, test)

bind_rows(
  linear = chocolate_metrics(lin_test, estimate = .pred, truth = rating),
  rf = chocolate_metrics(rf_test, estimate = .pred, truth = rating),
  boost = chocolate_metrics(boost_test, estimate = .pred, truth = rating),
  .id = "model"
)
```

model	.metric	.estimator	.estimate
linear	mae	standard	0.3350422
linear	rmse	standard	0.4192900
linear	interval_error	standard	1.3317536
rf	mae	standard	0.3369499
rf	rmse	standard	0.4232499
rf	interval_error	standard	1.3238547
boost	mae	standard	0.5888508
boost	rmse	standard	0.6873917
boost	interval_error	standard	2.3048973

The same patterns appear when plotting the test predictions. The boosted model seems to be biased low. The random forest predicts in a wider range than the linear model, but has comparable performance by overall error metrics. I would prefer the linear model here because it is much simpler and easier to interpret.

```
test_overall <- tibble(
  actual = test[["rating"]], linear = lin_test[[".pred"]],
  rf = rf_test[[".pred"]], boosted = boost_test[[".pred"]],
  ref = test[["ref"]]
)
fitted_actual_plot(overall, -actual)
```

Again, the low-rated bars confounded the models the most.

```
left_join(test_overall, test, by = "ref") |>
  select(specific_bean_origin_or_bar_name, actual, linear, rf, boosted) |>
  arrange(-abs(linear - actual))
```

specific_bean_origin_or_bar_name	actual	linear	rf	boosted
Ghana	1.50	3.325772	3.428558	2.721420
Ghana	1.50	3.325772	3.428558	2.721420
Brazil Rio Doce	1.75	3.182069	3.246800	2.669113
Carre Amer	2.00	3.342378	2.882500	2.509362
Los Ancones P.	2.00	3.342378	2.882500	2.509362
Hawai'i Island, Kona Estate, Hualalai Mtn	2.00	3.342378	2.882500	2.509362
Carenero Superior, Gran Saman	2.00	3.298950	2.769823	2.439764
Jamaique	2.00	3.298950	2.769823	2.439764
Colombian Semi Dark	2.00	3.298950	2.769823	2.439764
Mexico	1.50	2.778318	2.688125	2.502953
Le Noir Extra Amer	1.50	2.778318	2.688125	2.502953
Venezuela	2.00	3.229524	3.427396	2.658966
Sambirano, Ambanja, Madagascar	2.00	3.229524	3.427396	2.658966
New Ireland, batch 1702	2.25	3.368018	3.337769	2.721420
Puerto Rico	2.25	3.368018	3.337769	2.721420
Dominican Republic	2.25	3.368018	3.337769	2.721420

specific_bean_origin_or_bar_name	actual	linear	rf	boosted
Jamaica a l'ancienne	2.00	3.115530	3.044412	2.608510
Tanzania	2.00	3.086256	2.658375	2.478051
Rio Caribe	2.50	3.467259	2.927185	2.599765
Trinatario Treasure	2.00	2.959882	3.017837	2.593539
Anamalai, Tamil Nadu	2.50	3.427559	3.281122	2.717868
Ucayali	2.50	3.427559	3.281122	2.717868
Patanemo	2.25	3.173674	3.035062	2.538015
Ambanja, Sambirano Valley	2.25	3.173674	3.035062	2.538015
Soconusco, Rayen Cacao Co-op, batch 21154	4.00	3.099089	3.257679	2.545541
Ba Ria Vung Tau Province	2.25	3.143862	3.048012	2.538015
Patanemo	2.25	3.143862	3.048012	2.538015
Panama	3.75	2.857059	3.017292	2.489229
Baracoa	3.75	2.857059	3.017292	2.489229
Jamaica	2.50	3.385320	3.472052	2.691667
Equateur	2.50	3.385320	3.472052	2.691667
Porcelana, Apotequil	4.00	3.115977	3.131983	2.593721
Porcelana, Tabasco, Marfil de Blanco	4.00	3.115977	3.131983	2.593721
Asante	4.00	3.115977	3.131983	2.593721
Palo Blanco w/ panela, Chulucanas, b. 120725A	2.00	2.883959	2.598958	2.356984
100 percent	3.50	2.618073	2.966427	2.356778
Carribean, Arawak	3.50	2.618073	2.966427	2.356778
Latino	3.50	2.618073	2.966427	2.356778
Marcial, single Cote, 2012	4.00	3.123965	3.090556	2.681471
Toledo District	4.00	3.123965	3.090556	2.681471
Java	4.00	3.123965	3.090556	2.681471
Ocumare	3.75	2.880538	3.094311	2.596778
Rio Arriba	3.75	2.880538	3.094311	2.596778
Sur del Lago	3.25	2.386183	1.997937	1.750431
Sambirano Valley, #216, MR, LC	3.25	2.386183	1.997937	1.750431
Peru, Ecuador	3.25	2.386183	1.997937	1.750431
Chiapas	2.50	3.358775	3.080004	2.618512
Trincheras	2.50	3.358775	3.080004	2.618512
Madagascar	4.00	3.141923	3.138844	2.640343
Trinidad	2.50	3.342597	3.039430	2.518457
Maya Mtn, Toledo	4.00	3.158892	3.270334	2.675683
Vanuatu	2.00	2.832059	2.900042	2.496932
Kumasi Sambirano, Ghana & Madagascar	2.00	2.832059	2.900042	2.496932
Hawai'i Island, Hamakua, Hawaiian Crown, b. 176	3.50	2.689148	2.909659	2.527563
Criollo Blend	3.50	2.689148	2.909659	2.527563
Kulili P., 2013	4.00	3.198445	3.310453	2.721087
Manabi	3.50	2.699511	2.937170	2.527563
Dominican Republic	3.50	2.699511	2.937170	2.527563
Venezuela	4.00	3.201377	3.201949	2.580531
Sambirano, Ambanja, Madagascar	4.00	3.201377	3.201949	2.580531
Taiwan, #1	2.50	3.297515	3.339966	2.731697
100 percent	1.50	2.296644	1.620417	1.561507
Carribean, Arawak	1.50	2.296644	1.620417	1.561507
Latino	1.50	2.296644	1.620417	1.561507
ABOCFA Coop	4.00	3.209173	3.185885	2.720898
Peru	2.50	3.275016	2.987511	2.731774
Three Amigos(Chuao, Wild Bolivia, D.R.)	4.00	3.228243	3.623607	2.757824
New Ireland, batch 1702	2.50	3.270293	3.386111	2.735249

specific_bean_origin_or_bar_name	actual	linear	rf	boosted
Puerto Rico	2.50	3.270293	3.386111	2.735249
Dominican Republic	2.50	3.270293	3.386111	2.735249
Chuao, batch 1089	2.50	3.258912	3.493744	2.717868
Malah Na Bulong	2.50	3.258912	3.493744	2.717868
Ivory Coast, Rainforest Alliance, batch 7	2.50	3.258912	3.493744	2.717868
Ucayali, 2017 h., batch PU024	4.00	3.243651	3.234271	2.691248
Amazonas	4.00	3.243651	3.234271	2.691248
Piura	4.00	3.243651	3.234271	2.691248
Ben Tre	3.75	2.994392	3.153412	2.589573
Peru	2.50	3.253374	2.862176	2.478118
Peru	2.50	3.253374	2.862176	2.478118
Dominican Republic	2.25	2.995746	3.151875	2.523050
Asajaya E, NW Borneo, b. #132/4500	2.50	3.240438	3.327300	2.729844
Hispaniola, batch 170104	2.50	3.240438	3.327300	2.729844
Sambirano, batch 170102	2.50	3.240438	3.327300	2.729844
Samar, East Visayas region	2.50	3.232524	3.099336	2.561375
Santo Domingo	2.50	3.232524	3.099336	2.561375
Sur del Lago	4.00	3.273845	3.128708	2.691248
Sambirano Valley, #216, MR, LC	4.00	3.273845	3.128708	2.691248
Peru, Ecuador	4.00	3.273845	3.128708	2.691248
Conacado	2.25	2.975749	3.038198	2.573547
Madagascar, w/ shell	2.25	2.975749	3.038198	2.573547
Vanua Levu	2.75	3.462778	3.014219	2.639948
Vanua Levu	2.75	3.462778	3.014219	2.639948
Virunga	2.50	3.208246	3.508204	2.729844
San Martin, Batch 2	2.50	3.208246	3.508204	2.729844
Chuao, batch 1089	4.00	3.301453	3.301561	2.709585
Malah Na Bulong	4.00	3.301453	3.301561	2.709585
Ivory Coast, Rainforest Alliance, batch 7	4.00	3.301453	3.301561	2.709585
Ecuador	3.75	3.052004	3.014302	2.513717
Dominican Republic	3.75	3.052004	3.014302	2.513717
French Laundry 20th Anniversary, Peru, Belize	3.75	3.055161	2.883043	2.675683
Tabasco	2.50	3.194184	3.115369	2.604313
Coto Brus	2.50	3.194184	3.115369	2.604313
Amazonas	2.50	3.194034	3.259323	2.605911
Amazonas	2.50	3.194034	3.259323	2.605911
Alto Beni, Palos Blanco	2.50	3.193900	3.077904	2.551651
Porcelana	2.50	3.193900	3.077904	2.551651
Porcelana, Batch 5163	2.50	3.193900	3.077904	2.551651
100 percent	3.50	2.812426	3.111813	2.548497
Carribean, Arawak	3.50	2.812426	3.111813	2.548497
Latino	3.50	2.812426	3.111813	2.548497
Toscano Black	3.75	3.062724	3.261748	2.634680
Madagascar	2.50	3.182367	3.143507	2.538015
Ilblend	3.75	3.068595	3.342199	2.727357
Pisa	4.00	3.321207	3.523611	2.719490
Boyaca	2.50	3.177714	3.019955	2.576072
Matasawalevu	2.50	3.177714	3.019955	2.576072
Peru	2.75	3.427264	3.567241	2.757824
Barlovento, Familia Rojas	2.50	3.172944	3.138701	2.554025
Terreiro Velho P., Sao Tome & Principe	3.75	3.082046	3.232601	2.713640
Chuao, Hacienda San Jose	3.75	3.082046	3.232601	2.713640

specific_bean_origin_or_bar_name	actual	linear	rf	boosted
Suchitepequez E.	3.75	3.082046	3.232601	2.713640
San Martin	3.75	3.084874	3.055366	2.532174
Conacado	3.75	3.084874	3.055366	2.532174
La Red de Guanconejo, N. Highlands coop	3.75	3.084874	3.055366	2.532174
El Oro	3.75	3.085298	3.124323	2.658253
Santo Domingo	3.75	3.085298	3.124323	2.658253
Porcelana, Apotequil	2.75	3.410792	3.531925	2.718505
Porcelana, Tabasco, Marfil de Blanco	2.75	3.410792	3.531925	2.718505
Asante	2.75	3.410792	3.531925	2.718505
Bundibugyo District	2.50	3.156071	3.047405	2.541598
Camino Verde, Black S., batch cvu6030.0	2.50	3.156071	3.047405	2.541598
Mindanao Island	3.75	3.095796	3.143706	2.695832
Malekula Island	3.75	3.095796	3.143706	2.695832
Don Homero- Cerecita Valley	2.75	3.397848	2.966157	2.599765
Phantom	4.00	3.353538	3.097561	2.729844
El Carmen, batch 1003	4.00	3.353538	3.097561	2.729844
Tumbes Coop, batch 120724M	2.50	3.144193	3.274604	2.578397
Kongo, Highlands	2.50	3.144193	3.274604	2.578397
Downtown London	2.75	3.388168	3.374229	2.757824
Amazonas	2.75	3.388168	3.374229	2.757824
Manabi	2.50	3.133416	2.954178	2.691199
La Dalia, Lazy Growers Blend	4.00	3.368362	3.297963	2.731697
Indio Rojo	4.00	3.368362	3.297963	2.731697
Fazenda Camboa	2.75	3.380580	3.310912	2.742064
Puerto Quito, heirloom	2.75	3.380580	3.310912	2.742064
Madagascar	2.75	3.380580	3.310912	2.742064
Los Rios, Rancho Grande 2004/2007	2.00	2.630478	2.704531	2.290446
Puerto Plata	2.50	3.130220	3.114818	2.621636
Manabi	2.50	3.130220	3.114818	2.621636
La Joya	4.00	3.375686	3.305120	2.748666
Dark	2.00	2.621871	2.643021	2.433793
Extra Dark	2.00	2.621871	2.643021	2.433793
D.R. Congo, Cru Virunga	4.00	3.378926	3.124260	2.683881
Madagascar	4.00	3.378926	3.124260	2.683881
Ecuador	2.75	3.370280	3.299333	2.757824
Apurimac, El Quinacho Co-op	2.75	3.370280	3.299333	2.757824
Sangre Grande P.	2.75	3.370280	3.299333	2.757824
Asajaya E, NW Borneo, b. #132/4500	2.75	3.369245	3.395037	2.729844
Hispaniola, batch 170104	2.75	3.369245	3.395037	2.729844
Sambirano, batch 170102	2.75	3.369245	3.395037	2.729844
Boyaca	2.75	3.369136	3.241851	2.715938
Matasawalevu	2.75	3.369136	3.241851	2.715938
Fazenda Camboa, Bahia, batch 17009	3.75	3.132665	3.180037	2.675683
Lumas, 2015 Harvest, Batch 6, brown sugar	2.25	2.858522	2.799126	2.526022
Belize, 2014 Harvest, Batch 9	2.25	2.858522	2.799126	2.526022
Wild Tranquilidad, harvest 2018, batch 9	3.75	3.141519	3.248772	2.694019
Guasare, Rosario de Perija, b.4279-GUA201123	3.75	3.141519	3.248772	2.694019
La Red	2.75	3.356705	3.188885	2.721087
Anamalai, Tamil Nadu	2.75	3.355928	2.985787	2.724528
Ucayali	2.75	3.355928	2.985787	2.724528
Venezuela, Trinidad	2.50	3.103506	2.838123	2.535245
Brooklyn Blend	2.50	3.103506	2.838123	2.535245

specific_bean_origin_or_bar_name	actual	linear	rf	boosted
Ghana, batch 021813	3.50	2.897593	2.848240	2.494426
Porcelana	3.75	3.147784	3.018353	2.675683
Honduras	2.75	3.351787	3.039688	2.711635
El Rosario, Xocunuzco, Cusco, Sambirano	4.00	3.398511	3.397747	2.752523
Perseverance E.	4.00	3.398511	3.397747	2.752523
Monte Alegre, 3 diff. plantations	4.00	3.399267	3.039018	2.625597
Monte Alegre, 3 diff. plantations	4.00	3.399267	3.039018	2.625597
Porcelana	4.00	3.403386	3.250435	2.721087
Chuao	2.50	3.096244	3.025500	2.536686
Grenada	2.50	3.087983	3.165201	2.603509
O'Payo Profundo, Waslala, DR-LC, #271, b. 21-433	4.00	3.415693	3.397794	2.726458
Chuao Village, BR-SC, batch 21-437	4.00	3.415693	3.397794	2.726458
Conacado	3.75	3.167808	3.018267	2.551651
Chuao	3.75	3.168983	3.196369	2.657351
Gran Couva	2.75	3.325055	3.400994	2.735249
Los Rios, Hacienda Limon, Heirloom	3.75	3.178850	3.438322	2.731774
Java, Javablond	3.75	3.180190	3.345295	2.650030
Ecuador	3.75	3.183480	3.388124	2.728684
Star of Ecuador	3.75	3.183480	3.388124	2.728684
La Masica, 2015 harvest, b. LH74HORZConcheV2	3.75	3.184261	3.448568	2.694019
Piura, Perou	2.50	3.064670	3.053348	2.536686
Trinidad & Tobago	3.75	3.187283	3.461694	2.743472
Tenende, Uwate	3.75	3.188203	3.248620	2.675683
Dominican Republic, rustic	3.75	3.188203	3.248620	2.675683
Maya Mountain	2.75	3.311639	3.194590	2.721087
Bolivia	2.75	3.311639	3.194590	2.721087
Wasatch	2.75	3.311639	3.194590	2.721087
Sambirano 2006	2.75	3.311196	3.036302	2.677293
Colombie	2.75	3.311155	2.979179	2.627664
Bahia Black, batch bra50722.1	4.00	3.440297	3.542625	2.735249
Tien Giang, Black S., batch VIT60420.0	4.00	3.440297	3.542625	2.735249
Venezuela	2.75	3.308980	3.554031	2.731774
Bolivia	2.75	3.308980	3.554031	2.731774
Porcelana, Venezuela	4.00	3.441172	3.701579	2.718505
Fazenda Camboa	3.75	3.197102	3.429702	2.729844
Puerto Quito, heirloom	3.75	3.197102	3.429702	2.729844
Madagascar	3.75	3.197102	3.429702	2.729844
Bambamarca, 2015	2.75	3.298346	3.541404	2.757824
Ecuador	2.75	3.298346	3.541404	2.757824
Maracaibo, El Rosario	4.00	3.454330	3.779999	2.728680
Peru	2.50	3.045505	2.950834	2.593287
Ocumare	3.75	3.208179	3.441468	2.667470
Carenero, Guapiles, Ocumare blend	3.75	3.210896	3.185736	2.664973
Hispaniola w/ nibs	3.75	3.210896	3.185736	2.664973
Lanquin Estate	3.75	3.211264	3.296032	2.719490
Pisa, batch HA102	3.75	3.211264	3.296032	2.719490
Ecuador	2.50	3.034865	3.128108	2.547020
Star of Ecuador	2.50	3.034865	3.128108	2.547020
Arauca	3.75	3.216342	3.262295	2.711635
Meta	3.75	3.216342	3.262295	2.711635
Tabasco	2.75	3.281891	3.284700	2.711001
West Indian, Rizek Historical S.	3.75	3.220928	3.489081	2.726458

specific_bean_origin_or_bar_name	actual	linear	rf	boosted
Peru	2.75	3.277405	3.319626	2.731774
Madagascar	2.75	3.277405	3.319626	2.731774
Piura	3.75	3.223135	2.988882	2.549203
Chanchamayo Province	3.75	3.223135	2.988882	2.549203
Rizek Cacao, batch DR 12	3.75	3.223135	2.988882	2.549203
Tumbes, batch 176	2.75	3.276210	2.922106	2.731774
Guaniamo, batch 173	2.75	3.276210	2.922106	2.731774
Papua New Guinea, batch 1	2.75	3.276210	2.922106	2.731774
Ocumare, Venezuela	2.50	3.025275	2.921053	2.504763
Ghana, prototype	2.50	3.025275	2.921053	2.504763
Trinidad & Tobago, prototype	2.50	3.025275	2.921053	2.504763
La Red	2.75	3.272553	3.148190	2.656127
Carenero, Criollo	2.75	3.270272	3.147292	2.574351
Cusco, Cacao Cusco	3.75	3.230842	3.189781	2.571922
Libanio	3.75	3.230842	3.189781	2.571922
Virunga	3.75	3.232618	3.237388	2.735249
San Martin, Batch 2	3.75	3.232618	3.237388	2.735249
San Juan Estate	3.75	3.232618	3.237388	2.735249
O'ahu Island, Waiahole, b. 182	3.75	3.233461	3.243583	2.691248
Guadeloupe	2.75	3.264676	3.022229	2.533452
Tan Phu Dong, Treasure Island	2.75	3.264676	3.022229	2.533452
Indonesia	2.75	3.263293	3.576797	2.719490
Kokoa Kamili	3.75	3.237555	3.327887	2.719490
Dominican Republic	3.75	3.237566	3.418236	2.729844
El Gran Sapasoa, batch IP7487	3.75	3.238808	3.277087	2.691248
Chef's Blend	4.00	3.495144	3.498320	2.757824
Patanemo	4.00	3.495144	3.498320	2.757824
Maracaibo, El Vigia	4.00	3.495144	3.498320	2.757824
Sambirano	3.75	3.246658	3.292415	2.614668
Carupano Pintao	2.75	3.250908	3.026478	2.691692
Bagua, Amazonas	2.75	3.250908	3.026478	2.691692
Costa Rica	2.75	3.250872	3.139396	2.722330
Peru	2.75	3.250872	3.139396	2.722330
Ecuador	2.75	3.250872	3.139396	2.722330
Santo Domingo	2.75	3.250872	3.139396	2.722330
Ben Tre	3.75	3.253719	3.181441	2.715938
Toscano Black	3.75	3.255232	3.265580	2.675683
Akesson P., Sambirano	3.75	3.255232	3.265580	2.675683
"heirloom", Arriba Nacional	3.75	3.256199	3.256482	2.720200
Chantaburi	3.75	3.259062	3.408028	2.724528
Piura Gran Blanco, Sisyu & Kiriya Phoenix	3.75	3.259062	3.408028	2.724528
San Martin	2.50	2.989899	2.926734	2.515415
Ucayali, 2017 h., batch PU024	3.75	3.260257	3.394100	2.724528
Amazonas	3.75	3.260257	3.394100	2.724528
Piura	3.75	3.260257	3.394100	2.724528
Chuao, batch 1089	2.50	2.986818	2.978461	2.502873
Malah Na Bulong	2.50	2.986818	2.978461	2.502873
Ivory Coast, Rainforest Alliance, batch 7	2.50	2.986818	2.978461	2.502873
Kokoa Kamili, Kilombero District	3.75	3.266235	3.705704	2.719490
Dominican Republic	3.75	3.266235	3.705704	2.719490
Ecuador	2.50	2.983149	3.088672	2.543220
Apurimac, El Quinacho Co-op	2.50	2.983149	3.088672	2.543220

specific_bean_origin_or_bar_name	actual	linear	rf	boosted
Sangre Grande P.	2.50	2.983149	3.088672	2.543220
Hawai'i Island, Hamakua, Hawaiian Crown, b. 176	2.75	3.232267	3.220017	2.691248
Criollo Blend	2.75	3.232267	3.220017	2.691248
O'ahu Island, Maunawili, Agri Research C., 2015	3.75	3.268829	3.287428	2.721420
Alto Beni, Upper Rio Beni, 2015	3.75	3.268829	3.287428	2.721420
Patanemo, Epoch, Donaldo	3.75	3.270446	2.936981	2.691248
Sierra Nevada, Tutu Iku	3.75	3.273878	3.249890	2.735249
Maranon Canyon	3.25	2.777475	2.995000	2.490246
UNOCACE	2.75	3.222040	3.589897	2.757824
San Juan Estate	2.75	3.222040	3.589897	2.757824
Bejofo	3.00	3.465428	3.384096	2.715938
Tanzania	3.00	3.465428	3.384096	2.715938
Pinchincha, Mindo, Coop Nueva Esper., 2015	3.75	3.286952	3.302030	2.716370
La Masica, Batch 1, FHIA Research Center	3.75	3.286952	3.302030	2.716370
Hacienda Victoria	3.75	3.287052	3.598496	2.742064
Ocumare 77	3.75	3.287052	3.598496	2.742064
Chiapas, Mokaya P.	3.75	3.287056	3.141666	2.675514
Napa	3.75	3.287056	3.141666	2.675514
Tabaquite, batch 12	2.75	3.212459	3.140634	2.715938
Wampusirpi	2.75	3.212459	3.140634	2.715938
La Red	3.75	3.288304	3.406870	2.729844
Madagascar, Batch 8	2.75	3.209943	3.232448	2.695832
Ecuador	2.75	3.209678	3.285265	2.727357
Tanzania	2.75	3.209678	3.285265	2.727357
Dominican Republic	2.75	3.209432	3.246047	2.675683
San Francisco de Macoris, Cibao region	3.75	3.291825	3.384251	2.729844
Zorzal Reserva w/ Charles Kerchner	3.75	3.291825	3.384251	2.729844
Zorzal Reserva, 2015 H., Kerchner	3.75	3.294215	3.369012	2.729844
Ocumare, H. Cata, 48hr c.	3.75	3.298491	3.376510	2.735249
Alto Beni, Wild Harvest, Itenez R. 24hr c.	3.75	3.298491	3.376510	2.735249
Kokoa Kamili, Kilombero District	2.75	3.201490	3.048243	2.554025
Dominican Republic	2.75	3.201490	3.048243	2.554025
La Dalia, Matagalpa,cacao Bisesto,green label	2.75	3.200854	3.098648	2.694176
Costa Rica	2.75	3.199989	3.363417	2.590618
Peru	2.75	3.199989	3.363417	2.590618
Ecuador	2.75	3.199989	3.363417	2.590618
Santo Domingo	2.75	3.199989	3.363417	2.590618
Oko Caribe, batch 0719	3.50	3.050644	3.036319	2.556380
Venezuela, batch 107	3.50	3.050644	3.036319	2.556380
Carre Amer	3.75	3.301115	3.522894	2.705477
Los Ancones P.	3.75	3.301115	3.522894	2.705477
Hawai'i Island, Kona Estate, Hualalai Mtn	3.75	3.301115	3.522894	2.705477
Chiapas	3.00	3.448341	3.389079	2.745224
Trincheras	3.00	3.448341	3.389079	2.745224
Rio Caribe	3.75	3.303010	3.413207	2.729844
La Selva	3.75	3.303010	3.413207	2.729844
El Rosario, Xoconuzco, Cusco, Sambirano	2.75	3.196866	3.055613	2.706736
Perseverance E.	2.75	3.196866	3.055613	2.706736
Sambirano	3.50	3.055474	3.229144	2.655893
Madagascar, lot M0403R	3.75	3.306830	3.231596	2.642647
Somia Plantation, Sambirano, 70hr C	3.75	3.308287	3.456542	2.743035
Tingo Maria	3.75	3.308354	3.300183	2.691692

specific_bean_origin_or_bar_name	actual	linear	rf	boosted
Kokoa Kamili	3.75	3.308354	3.300183	2.691692
Ocumare, H. Cata, 48hr c.	3.75	3.309249	3.905827	2.743035
Alto Beni, Wild Harvest, Itenez R. 24hr c.	3.75	3.309249	3.905827	2.743035
Vanua Levu	3.50	3.061492	3.135619	2.533780
Vanua Levu	3.50	3.061492	3.135619	2.533780
Bolivar	2.50	2.938205	2.377562	2.273130
Cumboto, farmer Jose Lugo, batch 1	2.75	3.187175	3.124319	2.578397
Sambirano	2.75	3.186728	3.389552	2.554173
Moho Valley	2.75	3.186728	3.389552	2.554173
Tabasco	3.75	3.313592	3.366397	2.718300
Coto Brus	3.75	3.313592	3.366397	2.718300
Peru	3.75	3.316504	3.198827	2.642647
Maranon Canyon	3.75	3.316504	3.198827	2.642647
Carenero Superior, Gran Saman	3.75	3.318034	3.623669	2.714329
Jamaique	3.75	3.318034	3.623669	2.714329
Colombian Semi Dark	3.75	3.318034	3.623669	2.714329
Ghana	2.75	3.179907	3.434108	2.683496
Ghana	2.75	3.179907	3.434108	2.683496
Arauca	3.00	3.429024	3.481820	2.735249
Tingo Maria	3.00	3.429024	3.481820	2.735249
Chiapas, Triple Cacao	2.75	3.178376	3.190855	2.680204
Ecuador	2.75	3.178376	3.190855	2.680204
Ghana	2.75	3.177923	2.842670	2.691248
Zorzal Reserva	3.50	3.073629	3.102556	2.638848
Piura Blanco, Norandino	3.50	3.073629	3.102556	2.638848
Monte Grande, batch 18	2.75	3.172730	2.915534	2.675683
Tumaco, batch 23abc	2.75	3.172730	2.915534	2.675683
La Red	3.50	3.077787	3.371281	2.554173
La Red	3.50	3.077787	3.371281	2.554173
Camino Verde P., Balao, 2015 harvest, batch8	3.75	3.329599	3.458346	2.725570
Ecuador, 2013	2.75	3.169616	3.350997	2.729844
Moho River Valley	2.75	3.169616	3.350997	2.729844
O'Payo	2.75	3.169223	3.263310	2.681471
Grand Cru Ecuador	3.50	3.082981	3.037015	2.658253
Satipo Pangoa region, 20hr conche	3.50	3.082981	3.037015	2.658253
Vanuatu, batch 2410	2.75	3.166999	3.175668	2.703631
Ecuador	2.75	3.166999	3.175668	2.703631
Belize, 2013	2.75	3.166999	3.175668	2.703631
Bundibugyo	2.75	3.166999	3.175668	2.703631
Lachua w/ cane sugar	3.00	3.414957	3.546976	2.757824
Peru	3.00	3.414957	3.546976	2.757824
Toscano Black	2.75	3.163478	3.154345	2.720226
Akesson P., Sambirano	2.75	3.163478	3.154345	2.720226
Northerner, Madagascar and Brazil	3.50	3.089216	3.125693	2.695435
Hacienda Victoria	3.50	3.090338	3.079850	2.568393
Maranon	2.75	3.159484	3.091969	2.590618
Chocoan Rainforest, Teroro Escondido, ESM	2.75	3.159484	3.091969	2.590618
Turrialba, Cartago P.	3.50	3.092936	3.262422	2.675683
Montserrat Hills	3.50	3.092936	3.262422	2.675683
Camino Verde P.	3.50	3.092936	3.262422	2.675683
Ecuador	3.75	3.343422	3.176592	2.735249
Apurimac, El Quinacho Co-op	3.75	3.343422	3.176592	2.735249

specific_bean_origin_or_bar_name	actual	linear	rf	boosted
Sangre Grande P.	3.75	3.343422	3.176592	2.735249
Manabi	2.75	3.155529	3.048004	2.681471
Dominican Republic	2.75	3.155529	3.048004	2.681471
Brazil	3.50	3.094941	3.223650	2.588455
Alto Beni	3.50	3.094941	3.223650	2.588455
Dominican Republic	3.25	2.845121	2.806406	2.584632
Onyx	3.25	2.845121	2.806406	2.584632
Upala, Batch 18	3.25	2.845121	2.806406	2.584632
Karkar Island	3.50	3.095796	3.143706	2.695832
Cahabon	2.75	3.153254	2.849317	2.675683
Satipo region, white label	2.75	3.150122	3.016344	2.613383
Eti-Oni	2.75	3.148168	3.463430	2.681471
Dominican Nacional, Collection 01	3.75	3.352307	3.331477	2.720226
Matasawalevu, batch FJMA1	2.75	3.146998	3.088972	2.540840
Ecuador	3.50	3.104347	3.036990	2.587568
Dominican Republic	3.50	3.104347	3.036990	2.587568
O'Payo Profundo, Waslala, DR-LC, #271, b. 21-433	3.75	3.357407	3.424036	2.717868
Chuao Village, BR-SC, batch 21-437	3.75	3.357407	3.424036	2.717868
Shake Shack, Peru, Mad., Dom. Rep.	3.50	3.107533	3.322427	2.695435
Madagascar	3.50	3.107533	3.322427	2.695435
Fiji, batch 51019	3.00	3.389026	3.208296	2.717868
Chunchu, Ayacucho, lot 208	3.00	3.389026	3.208296	2.717868
Madagascar, Ambolikapiky P.	2.75	3.137374	3.078082	2.560506
Dominican Republic w/ nibs	2.75	3.137374	3.078082	2.560506
Madagascar	2.75	3.137374	3.078082	2.560506
Mount Pleasant	3.00	3.387237	3.426115	2.721420
Zorzal Plantation	3.75	3.363109	3.230728	2.715938
Guatemala	3.75	3.363109	3.230728	2.715938
Puerto Cabello, Criollo	3.75	3.363561	3.100330	2.636255
Camino Verde P., Balao, Guayas, "Fruity"	3.75	3.363561	3.100330	2.636255
Camino Verde P., Balao, Guayas, "Floral"	3.75	3.363561	3.100330	2.636255
Madagascar, Ambolikapiky P.	2.75	3.134775	3.270734	2.717780
Dominican Republic w/ nibs	2.75	3.134775	3.270734	2.717780
Madagascar	2.75	3.134775	3.270734	2.717780
Rio Caribe	2.75	3.134616	3.118009	2.636418
La Selva	2.75	3.134616	3.118009	2.636418
Tien Giang	3.50	3.119158	3.151410	2.540840
Maya Mtn	3.50	3.119158	3.151410	2.540840
Johe	2.75	3.129417	3.010639	2.675683
Camino Verde P., Balao, Guayas, 2012	2.75	3.129417	3.010639	2.675683
Baracoa	3.50	3.120704	3.036459	2.537373
Dominican Republic	2.50	2.877842	3.042736	2.455934
Carupano Pintao	3.00	3.376254	3.524528	2.740287
Bagua, Amazonas	3.00	3.376254	3.524528	2.740287
Matagalpa	3.50	3.124019	2.768983	2.521364
Elvesia P.	2.75	3.124240	3.410885	2.554173
Belize	3.50	3.129938	3.146829	2.565822
Venezuela, Trinidad	3.50	3.130385	3.440927	2.663801
Brooklyn Blend	3.50	3.130385	3.440927	2.663801
Idukki Hills, GoGround, batch 0089	3.00	3.369557	3.171624	2.711635
Gran Couva	3.50	3.131431	3.131421	2.565822
ROIG	3.50	3.131431	3.131421	2.565822

specific_bean_origin_or_bar_name	actual	linear	rf	boosted
Tanzania	3.00	3.368355	3.427271	2.721420
Sur del Lago	3.25	2.882928	3.262924	2.596778
Manabi	3.50	3.132963	3.048889	2.706736
Vietnam	3.50	3.132963	3.048889	2.706736
Dark	2.50	2.866361	3.345740	2.635520
Extra Dark	2.50	2.866361	3.345740	2.635520
Bahia, Fazenda Venturosa	3.50	3.135330	3.071865	2.565822
UNOCACE	2.75	3.114626	3.136847	2.703631
San Juan Estate	2.75	3.114626	3.136847	2.703631
O'ahu Island, Maunawili, Agri Research C., 2015	3.50	3.135983	3.057532	2.540840
Alto Beni, Upper Rio Beni, 2015	3.50	3.135983	3.057532	2.540840
Maya Mountain	3.50	3.136564	3.284287	2.731774
Bolivia	3.50	3.136564	3.284287	2.731774
Wasatch	3.50	3.136564	3.284287	2.731774
Tsaranta	3.50	3.137004	2.942948	2.412241
Venezuela	2.75	3.112757	3.144479	2.554173
Maranon Canyon, Fortunato No. 4	3.50	3.137663	3.225792	2.578397
Costa Rica	3.50	3.137663	3.225792	2.578397
Manabi	3.75	3.389210	3.444365	2.727500
Vietnam	3.75	3.389210	3.444365	2.727500
Madagascar, Ambolikapiky P.	3.00	3.358000	3.371935	2.737841
Dominican Republic w/ nibs	3.00	3.358000	3.371935	2.737841
Madagascar	3.00	3.358000	3.371935	2.737841
The Other One, Grand Cru	3.50	3.143440	3.210832	2.565822
Wild Thing	3.50	3.143440	3.210832	2.565822
Zorzal, batch 1	3.50	3.144750	2.950471	2.531183
Vietnam	3.50	3.144750	2.950471	2.531183
Kokoa Kamili, lot TZ72199	3.50	3.145479	3.174430	2.585849
Nativo, Varzea	3.50	3.145654	3.225458	2.556850
Selvagem, Jari	3.50	3.145654	3.225458	2.556850
Venezuela	3.50	3.145654	3.225458	2.556850
Nicaragua, lot N510	3.50	3.145654	3.225458	2.556850
San Martin	3.00	3.354289	3.204891	2.718300
Belize	3.25	2.897665	3.014206	2.460892
Nosy Be Isle.	3.00	3.352167	3.075611	2.580262
Hacienda Victoria	3.75	3.398091	3.423448	2.742064
Ocumare 77	3.75	3.398091	3.423448	2.742064
Dominican Republic	3.75	3.399919	3.128458	2.731774
Guadeloupe	3.50	3.151628	3.245703	2.556850
Tan Phu Dong, Treasure Island	3.50	3.151628	3.245703	2.556850
Alto Beni, Palos Blanco	3.00	3.346137	3.279219	2.731774
Porcelana	3.00	3.346137	3.279219	2.731774
Porcelana, Batch 5163	3.00	3.346137	3.279219	2.731774
Patanemo	3.00	3.344294	3.468339	2.716370
Ambanja, Sambirano Valley	3.00	3.344294	3.468339	2.716370
Grenada	2.50	2.844198	2.799525	2.490352
Pisa, lot 03HA	3.50	3.158461	3.002978	2.515557
Nugu, lot 02N	3.50	3.158461	3.002978	2.515557
Panama	3.50	3.163249	3.269222	2.683653
Baracoa	3.50	3.163249	3.269222	2.683653
Nicaragua, batch 164	3.00	2.663688	2.218375	1.995113
IL100, H. San Jose, batch NDL3A01	3.00	2.663688	2.218375	1.995113

specific_bean_origin_or_bar_name	actual	linear	rf	boosted
Chanchamayo, Pichanadi, 2012, 60hr c., b.13092	3.00	2.663688	2.218375	1.995113
Java, Indonesian Black	3.00	2.663688	2.218375	1.995113
Peru	2.75	3.085111	3.299048	2.618851
Semai Community, Kamping Long B, Pahang	3.50	3.164926	3.105306	2.576516
Dominican Republic, batch 7	2.75	3.084613	3.076124	2.532174
Vanuatu	3.00	3.334525	3.578466	2.714329
Kumasi Sambirano, Ghana & Madagascar	3.00	3.334525	3.578466	2.714329
Oko Caribe	3.50	3.169085	3.078036	2.526367
Guantupi River	2.75	3.080495	3.179186	2.678376
Lam Dong	3.50	3.170004	3.419090	2.719490
Lachua, Q'egchi families	3.50	3.170004	3.419090	2.719490
Tanzania	2.75	3.079862	2.993366	2.524821
Tanzania	3.00	3.329484	3.202979	2.721420
Ocumare, Cumboto, batch 16	3.50	3.170668	3.110963	2.605250
Amazonas, batch 14	3.50	3.170668	3.110963	2.605250
Hawai'i Island, Hawaiian Crown, Kona Vanilla	3.50	3.170668	3.110963	2.605250
Porcelana, Apotequil	3.00	3.328963	3.105521	2.603068
Porcelana, Tabasco, Marfil de Blanco	3.00	3.328963	3.105521	2.603068
Asante	3.00	3.328963	3.105521	2.603068
Ceylan	3.00	3.325378	3.014104	2.613243
Hawai'i Island, Hilo and Kona regions	3.50	3.178781	2.623552	2.539781
Tumbes, batch 176	3.50	3.178999	3.289311	2.719490
Guaniamo, batch 173	3.50	3.178999	3.289311	2.719490
Papua New Guinea, batch 1	3.50	3.178999	3.289311	2.719490
Sierra Nevada, Cienaga	2.75	3.070764	3.287472	2.695832
D.R. Congo, Cru Virunga	3.00	3.318179	3.357615	2.721974
Madagascar	3.00	3.318179	3.357615	2.721974
Costa Rica	3.50	3.183480	3.388124	2.728684
Peru	3.50	3.183480	3.388124	2.728684
Ecuador	3.50	3.183480	3.388124	2.728684
Santo Domingo	3.50	3.183480	3.388124	2.728684
Bejofo	3.00	3.316442	3.121642	2.625111
Tanzania	3.00	3.316442	3.121642	2.625111
La Laguna Plantation	3.50	3.185896	2.860733	2.552589
Conacado, 2012, 120hr c.batch 13092	2.75	2.438876	1.987625	1.750431
Jagassar Estate, Moruga Region, microlot	3.50	3.189168	3.432708	2.716370
Papua New Guinea	3.50	3.189749	3.332022	2.719490
Le Noir Amer, West Africa	2.75	3.058474	3.426667	2.658966
Chiapas, Triple Cacao	2.75	3.057902	3.084044	2.585016
Ecuador	2.75	3.057902	3.084044	2.585016
Dominican Republic	3.50	3.192957	3.553158	2.757824
Trinidad & Tobago	3.50	3.192957	3.553158	2.757824
Brazil, Batch 20316	2.75	3.056868	2.974639	2.513717
Oko Caribe, El Cibao, 2018 Harvest	2.75	3.056208	3.146641	2.621312
Xoconusco, cacao Real	3.00	3.306193	2.981632	2.526943
Nyangbo	3.00	3.306193	2.981632	2.526943
Bolivia, batch 85	3.00	3.305747	3.260898	2.735249
La Dalia	3.00	3.305747	3.260898	2.735249
Turrialba, Cartago P.	3.50	3.195372	3.136340	2.675683
Montserrat Hills	3.50	3.195372	3.136340	2.675683
Camino Verde P.	3.50	3.195372	3.136340	2.675683
Maranon	3.50	3.196315	3.374123	2.703131

specific_bean_origin_or_bar_name	actual	linear	rf	boosted
Chocoan Rainforest, Teroro Escondido, ESM	3.50	3.196315	3.374123	2.703131
Peru	3.25	2.946750	2.884969	2.460892
Peru	3.75	3.447410	3.483917	2.762966
Maya Mountain, Toledo	3.50	3.198660	3.427084	2.715938
Amazonas	2.75	3.050754	3.115521	2.500901
Amazonas	2.75	3.050754	3.115521	2.500901
Caracas, Venezuela and Ghana	3.50	3.205244	3.663302	2.714329
Djakarta, Java and Ghana	3.50	3.205244	3.663302	2.714329
Xoconusco, cacao Real	3.50	3.205264	3.266702	2.676073
Nyangbo	3.50	3.205264	3.266702	2.676073
Sao Tome, batch TRI-18-002, trinitario	3.00	3.294697	3.091556	2.725163
Papouasie	3.00	3.294697	3.091556	2.725163
Maya Mountain, 2017, batch 255	3.00	3.294697	3.091556	2.725163
Chef's Blend	3.75	3.455715	3.506587	2.757824
Patanemo	3.75	3.455715	3.506587	2.757824
Maracaibo, El Vigia	3.75	3.455715	3.506587	2.757824
Gran Couva	3.50	3.206266	3.159651	2.675683
ROIG	3.50	3.206266	3.159651	2.675683
Tumbes, batch 176	3.00	3.291894	3.328159	2.691248
Guaniamo, batch 173	3.00	3.291894	3.328159	2.691248
Papua New Guinea, batch 1	3.00	3.291894	3.328159	2.691248
Costa Rica	3.50	3.209173	3.185885	2.720898
Kokoa Kamili	3.50	3.209173	3.185885	2.720898
La Masica, FHIA	3.50	3.210069	3.167670	2.719490
Choroni, batch 210414	3.50	3.212114	3.035781	2.566393
Maranon Canyon, Fortunato No. 4	3.00	3.285834	3.511803	2.721420
Costa Rica	3.00	3.285834	3.511803	2.721420
Costa Rica	3.00	3.285708	3.421057	2.683984
Peru	3.00	3.285708	3.421057	2.683984
Ecuador	3.00	3.285708	3.421057	2.683984
Santo Domingo	3.00	3.285708	3.421057	2.683984
Maya Mountain, 2020 harvest, batch 20107	3.50	3.217989	3.255593	2.709585
Rabot Estate, Island Growers	3.50	3.218258	3.239342	2.721087
Peruvian Amazon	2.50	2.781685	2.785908	2.370569
Nube- prototype	2.50	2.781685	2.785908	2.370569
Chantaburi	3.50	3.220102	3.179054	2.616521
Piura Gran Blanco, Sisyu & Kiriya Phoenix	3.50	3.220102	3.179054	2.616521
Lachua w/ cane sugar	3.00	3.279106	3.357214	2.691692
Peru	3.00	3.279106	3.357214	2.691692
Zorzal Plantation	3.00	3.275897	3.568709	2.726458
Guatemala	3.00	3.275897	3.568709	2.726458
Paquibao E., 2016	3.00	3.275073	3.601573	2.731697
South Cotabato	3.00	3.275073	3.601573	2.731697
Saloy E., 2016	3.00	3.275073	3.601573	2.731697
Paquibao E., 2016	3.00	3.275073	3.601573	2.731697
South Cotabato	3.00	3.275073	3.601573	2.731697
Saloy E., 2016	3.00	3.275073	3.601573	2.731697
Peru	2.75	3.023708	2.922965	2.485975
Maranon Canyon	2.75	3.023708	2.922965	2.485975
Puerto Cabello, Criollo	3.50	3.226489	3.457110	2.704635
Camino Verde P., Balao, Guayas, "Fruity"	3.50	3.226489	3.457110	2.704635
Camino Verde P., Balao, Guayas, "Floral"	3.50	3.226489	3.457110	2.704635

specific_bean_origin_or_bar_name	actual	linear	rf	boosted
Bolivia, batch 166	2.75	3.022407	2.901913	2.506461
Costa Rica, batch 83	2.75	3.022407	2.901913	2.506461
Peru	3.00	3.272174	3.419557	2.743472
El Salvador	3.00	3.271488	3.391983	2.735249
Ocumare, Cumboto, batch 16	3.75	3.479596	3.465910	2.757824
Amazonas, batch 14	3.75	3.479596	3.465910	2.757824
Hawai'i Island, Hawaiian Crown, Kona Vanilla	3.75	3.479596	3.465910	2.757824
Dark 75, Ghana, Domin. Rep	3.00	3.266653	3.214729	2.668945
San Martin	3.00	3.266653	3.214729	2.668945
Rio Caribe	3.00	3.266653	3.214729	2.668945
Akesson's, batch 4411	3.50	3.233781	3.166488	2.695832
Granella	3.50	3.234265	3.287963	2.669863
Vila Gracinda	3.50	3.234265	3.287963	2.669863
Nibby	3.50	3.234265	3.287963	2.669863
Sierra Nevada, batch 1	3.50	3.234656	3.282223	2.691248
Porcelana	3.00	3.265268	3.416497	2.742064
Ecuador	2.50	2.763826	3.144062	2.416707
Tanzania	2.50	2.763826	3.144062	2.416707
Nicaragua, w/ inbs	3.50	3.236854	3.298477	2.729844
Dominican Republic	3.50	3.236854	3.298477	2.729844
Mekong Delta	3.00	3.262618	3.266104	2.701026
Sambirano, Rieur, Ambanja	3.00	3.262618	3.266104	2.701026
Cuzco	3.50	3.237608	3.398919	2.691692
Pisa	3.00	3.259791	3.434700	2.728386
La Colonia, batch 5	3.50	3.243021	3.364428	2.709585
Semuliki, 2017-18 h., batch SU72conche22212621	3.50	3.243021	3.364428	2.709585
Carenero, Guapiles, Ocumare blend	2.75	3.005768	2.775070	2.479260
Hispaniola w/ nibs	2.75	3.005768	2.775070	2.479260
Madagascar	3.00	3.255241	3.395052	2.566393
Ocumare, Venezuela	3.00	3.253500	3.222885	2.728765
Ghana, prototype	3.00	3.253500	3.222885	2.728765
Trinidad & Tobago, prototype	3.00	3.253500	3.222885	2.728765
Pisa	3.50	3.248096	3.051818	2.715938
Venezuela	3.00	3.250548	3.474306	2.721420
Bolivia	3.00	3.250548	3.474306	2.721420
Vanuatu, batch 2410	3.00	3.250548	3.474306	2.721420
Ecuador	3.00	3.250548	3.474306	2.721420
Belize, 2013	3.00	3.250548	3.474306	2.721420
Bundibugyo	3.00	3.250548	3.474306	2.721420
Dong Nai	3.50	3.252012	3.529863	2.723570
Sambirano	3.00	3.246205	3.380601	2.590618
Chuao	3.00	3.246205	3.380601	2.590618
Trinite	3.00	3.246205	3.380601	2.590618
Lumas, 2015 Harvest, Batch 6, brown sugar	3.00	2.753924	3.080401	2.371980
Belize, 2014 Harvest, Batch 9	3.00	2.753924	3.080401	2.371980
Zorzal Estate, 2017 h.	3.00	3.245218	3.337826	2.724528
Jamaica, #206, DR, LC	3.00	3.244573	3.211166	2.633695
Jamaica, #205, DR, MC	3.00	3.244573	3.211166	2.633695
Carenero Superior, #203, MR, SC	3.00	3.244573	3.211166	2.633695
South Cotabato	3.50	3.256522	3.439740	2.717868
Belize	3.50	3.256522	3.439740	2.717868
Guatemala	3.50	3.256661	3.344914	2.718300

specific_bean_origin_or_bar_name	actual	linear	rf	boosted
Madagascar	3.00	3.242503	3.185514	2.590618
Carribean	3.00	2.758155	2.892470	2.436199
Carribean-Raw	3.00	2.758155	2.892470	2.436199
Fiji, batch 51019	3.75	3.509609	3.553695	2.720226
Chunchu, Ayacucho, lot 208	3.75	3.509609	3.553695	2.720226
Madagascar	2.50	2.740112	3.039813	2.531140
Conacado, #212, LR, SC	3.50	3.260246	3.292347	2.691248
Chuao	3.00	3.237826	3.338094	2.590618
Kokoa Kamili Coop	3.00	3.237826	3.338094	2.590618
Tanzania	2.75	2.986960	3.130581	2.608201
Nativo, Varzea	3.00	3.235851	3.289134	2.691248
Selvagem, Jari	3.00	3.235851	3.289134	2.691248
Venezuela	3.00	3.235851	3.289134	2.691248
Nicaragua, lot N510	3.00	3.235851	3.289134	2.691248
Pisa, lot 03HA	3.00	3.235344	3.194690	2.721087
Nugu, lot 02N	3.00	3.235344	3.194690	2.721087
Marcial, single Cote, 2012	3.00	3.233461	3.243583	2.691248
Toledo District	3.00	3.233461	3.243583	2.691248
Java	3.00	3.233461	3.243583	2.691248
Bejofo	3.25	3.016544	3.094637	2.556380
Cuyagua, batch 4, lot DC2.3	3.25	3.016544	3.094637	2.556380
Choba Choba	3.25	3.016544	3.094637	2.556380
H. Betulia B6	3.00	3.233399	2.927640	2.715938
Anamalai, 2017 harvest	3.50	3.267430	3.522453	2.715938
Medagla, Xoco	3.50	3.269098	3.180150	2.735249
Kombone Village, 2018 Harvest	3.00	3.228350	2.994104	2.715938
Perfect Illusion	3.50	3.271876	3.282465	2.729844
Turrialba, Cartago P.	3.50	3.273334	3.519655	2.731774
Montserrat Hills	3.50	3.273334	3.519655	2.731774
Camino Verde P.	3.50	3.273334	3.519655	2.731774
Terreiro Velho P., Sao Tome & Principe	3.00	3.226106	3.269574	2.626888
Chuao, Hacienda San Jose	3.00	3.226106	3.269574	2.626888
Suchitepequez E.	3.00	3.226106	3.269574	2.626888
Bejofo	3.50	3.274745	3.285539	2.691692
Cuyagua, batch 4, lot DC2.3	3.50	3.274745	3.285539	2.691692
Choba Choba	3.50	3.274745	3.285539	2.691692
Kokoa Kamili	3.50	3.275073	3.601573	2.731697
La Bahia, w/ cane juice	3.25	3.025541	3.224613	2.606631
Carenero Superior	3.50	3.276298	3.596924	2.590565
Ocumare, Venezuela	3.00	3.222192	3.126823	2.707623
Ghana, prototype	3.00	3.222192	3.126823	2.707623
Trinidad & Tobago, prototype	3.00	3.222192	3.126823	2.707623
Bahia Superior	3.50	3.278549	3.540892	2.707623
South America and Africa	3.00	2.778866	3.174667	2.540399
Pinchincha, Mindo, Coop Nueva Esper., 2015	3.50	3.278996	3.472958	2.727500
La Masica, Batch 1, FHIA Research Center	3.50	3.278996	3.472958	2.727500
Chuao	3.50	3.280301	3.190266	2.691692
Kokoa Kamili Coop	3.50	3.280301	3.190266	2.691692
Sambirano, 2008	3.00	3.219109	2.986562	2.489565
Mexico	3.00	3.218766	3.404067	2.699650
Le Noir Extra Amer	3.00	3.218766	3.404067	2.699650
Semuliki Forest, Latitude Trading Co, batch 100	3.50	3.281554	3.210723	2.717868

specific_bean_origin_or_bar_name	actual	linear	rf	boosted
Cote d'Ivoire, batch 83	3.50	3.281554	3.210723	2.717868
Carenero Superior, Gran Saman	2.75	2.968264	2.639115	2.462852
Jamaique	2.75	2.968264	2.639115	2.462852
Colombian Semi Dark	2.75	2.968264	2.639115	2.462852
Ocumare	3.50	3.282325	3.305473	2.728765
Rio Arriba	3.50	3.282325	3.305473	2.728765
Daintree Estates, N. Queensland	3.25	3.032418	3.260007	2.605250
South Cotabato	3.50	3.282718	3.164038	2.637996
Belize	3.50	3.282718	3.164038	2.637996
Cahabon	3.00	3.214849	3.283135	2.715938
Morropon, Piura, AoC Golden Bean 2018	3.50	3.285193	3.212202	2.566219
Ucayali	3.50	3.285193	3.212202	2.566219
Ben Tre	3.50	3.285267	3.680777	2.718300
Peruvian Amazon	3.50	3.285910	3.306189	2.743472
Nube- prototype	3.50	3.285910	3.306189	2.743472
Chiapas, Mokaya P.	2.75	2.963480	2.881591	2.540399
Napa	2.75	2.963480	2.881591	2.540399
Fazenda Camboa	3.50	3.286615	3.509307	2.719490
Puerto Quito, heirloom	3.50	3.286615	3.509307	2.719490
Madagascar	3.50	3.286615	3.509307	2.719490
Piura	3.50	3.287758	3.322098	2.598576
Chanchamayo Province	3.50	3.287758	3.322098	2.598576
Rizek Cacao, batch DR 12	3.50	3.287758	3.322098	2.598576
Cuba, Batch 59/100	3.00	3.211624	3.065991	2.549974
Bolivia, batch 166	3.00	3.210482	3.331682	2.721420
Costa Rica, batch 83	3.00	3.210482	3.331682	2.721420
Sambirano	3.50	3.291592	3.413102	2.728684
Chuao	3.50	3.291592	3.413102	2.728684
Trinite	3.50	3.291592	3.413102	2.728684
Sambirano	3.25	3.043645	3.019759	2.597639
Chuao	3.25	3.043645	3.019759	2.597639
Trinite	3.25	3.043645	3.019759	2.597639
La Bahia, w/ cane sugar	3.00	3.205289	3.268678	2.719490
Costa Rica	3.00	3.205289	3.268678	2.719490
Caracas, Venezuela and Ghana	3.00	3.205244	3.663302	2.714329
Djakarta, Java and Ghana	3.00	3.205244	3.663302	2.714329
Akosombo	3.25	3.454198	3.495339	2.739669
San Francisco de Macoris, Cibao region	3.50	3.296050	3.094940	2.590618
Zorzal Reserva w/ Charles Kerchner	3.50	3.296050	3.094940	2.590618
La Colonia, batch 5	3.00	3.203941	3.358269	2.602692
Semuliki, 2017-18 h., batch SU72conche22212621	3.00	3.203941	3.358269	2.602692
Terreiro Velho P., Sao Tome & Principe	2.75	2.953482	2.921993	2.532078
Chuao, Hacienda San Jose	2.75	2.953482	2.921993	2.532078
Suchitepequez E.	2.75	2.953482	2.921993	2.532078
Maragda	3.00	3.203435	3.159857	2.728765
Nicaragua, batch 164	2.75	2.547283	2.248281	2.028687
IL100, H. San Jose, batch NDL3A01	2.75	2.547283	2.248281	2.028687
Chanchamayo, Pichanadi, 2012, 60hr c., b.13092	2.75	2.547283	2.248281	2.028687
Java, Indonesian Black	2.75	2.547283	2.248281	2.028687
Maranon	3.00	3.199588	2.865119	2.675683
Lachua, Cacao Verapaz	3.00	3.199588	2.865119	2.675683
Semuliki Forest, Latitude Trading Co, batch 100	3.25	3.449355	3.230906	2.717868

specific_bean_origin_or_bar_name	actual	linear	rf	boosted
Cote d'Ivoire, batch 83	3.25	3.449355	3.230906	2.717868
Macuare; Miranda; Chloe formula, H. La Trinidad	3.50	3.301100	3.322288	2.712627
Chuao, Aragua region, H. La Trinidad	3.50	3.301100	3.322288	2.712627
Non Pariel Estate	2.75	2.947646	2.991670	2.551744
Peru	3.25	3.052688	3.131925	2.579780
Rio Caribe, Macuro	3.50	3.303006	3.485133	2.677070
Madagascar	3.50	3.303006	3.485133	2.677070
Rio Caribe, Paria Penninsula	3.50	3.303006	3.485133	2.677070
Piura	3.50	3.303125	3.289715	2.720226
Ben Tre, batch 77	3.00	3.196567	3.006346	2.675683
O'Payo	3.00	3.196567	3.006346	2.675683
Pisa	3.50	3.305333	3.101885	2.719490
Kilombero	3.50	3.305333	3.101885	2.719490
Chuncho-Cuzco	3.50	3.305515	3.345073	2.720226
Piura, Norandino coop, cacao blanco	3.50	3.305515	3.345073	2.720226
Chiapas, Lacandon Jungle, Oaxacom Mtn	3.25	3.056355	2.966888	2.540399
Cooproagro	3.25	3.057709	3.374719	2.636418
Camino Verde, Guayas	3.25	3.057709	3.374719	2.636418
Tabaquite, batch 12	3.25	3.058583	3.026848	2.558616
Wampusirpi	3.25	3.058583	3.026848	2.558616
Ocumare, H. Cata, w/ nibs	3.50	3.309249	3.905827	2.743035
Talamanca, Raul-Kekoldo community	3.25	3.059527	3.015704	2.529726
Oro	3.25	3.059527	3.015704	2.529726
Arauca	3.25	3.440297	3.542625	2.735249
Puerto Rico	2.75	2.939950	2.933706	2.517499
Nativo, Varzea	3.50	3.311217	3.303527	2.735249
Selvagem, Jari	3.50	3.311217	3.303527	2.735249
Venezuela	3.50	3.311217	3.303527	2.735249
Nicaragua, lot N510	3.50	3.311217	3.303527	2.735249
Lanquin Estate	3.50	3.312749	3.322649	2.735249
Pisa, batch HA102	3.50	3.312749	3.322649	2.735249
Nicaragua, batch 164	2.25	2.437187	2.028260	1.869925
IL100, H. San Jose, batch NDL3A01	2.25	2.437187	2.028260	1.869925
Chanchamayo, Pichanadi, 2012, 60hr c., b.13092	2.25	2.437187	2.028260	1.869925
Java, Indonesian Black	2.25	2.437187	2.028260	1.869925
Alto Beni	3.50	3.313574	3.424738	2.720898
Finisterra, Ven., Trinidad, Mad.	3.00	2.814051	2.864354	2.520187
Sambirano, 2019 h., batch 7	3.50	3.314329	3.367246	2.709585
Selva Maya	3.50	3.314557	3.237309	2.569451
Ecuador	3.50	3.314916	3.592319	2.724528
Grand 'Anse	3.50	3.315207	3.244515	2.675514
Monte Alegre, 3 diff. plantations	3.75	3.565507	2.988268	2.625597
Monte Alegre, 3 diff. plantations	3.75	3.565507	2.988268	2.625597
Zorzal, batch 1	3.50	3.315763	3.187977	2.718300
Vietnam	3.50	3.315763	3.187977	2.718300
Anamalai	3.00	3.180705	3.371402	2.709585
Ecuador	2.75	2.570524	2.933438	2.374776
Misterio, Colombia, Ecuador	2.75	2.570524	2.933438	2.374776
Kilombero Valley, 2017 h., batch TK020	3.25	3.073201	3.030987	2.515557
Dominican Republic	3.00	3.176609	3.421417	2.719490
Onyx	3.00	3.176609	3.421417	2.719490
Upala, Batch 18	3.00	3.176609	3.421417	2.719490

specific_bean_origin_or_bar_name	actual	linear	rf	boosted
Markham Valley, #222, LR, 0C	3.00	3.174365	3.667211	2.719490
Ramnath E.	3.00	3.173588	3.294614	2.715938
Porcelana	3.50	3.328726	3.686581	2.757824
Soconusco, La Rioja Farm, Chiapas	3.50	3.329079	3.308056	2.715938
Chuao	3.50	3.329447	3.478217	2.724528
Ucayali	3.25	3.418273	3.390195	2.726458
Maya Mountain, Toledo District, batch 12-1	3.25	3.418273	3.390195	2.726458
Dominican Republic	3.25	3.081937	3.280219	2.673792
Colombia	3.00	3.166844	2.683348	2.539781
Ghana	3.00	3.166479	3.002740	2.546129
Conacado	2.75	2.916445	3.161271	2.540399
Madagascar, w/ shell	2.75	2.916445	3.161271	2.540399
Patanemo	3.00	3.165119	3.008240	2.531747
Guatemala	3.00	3.165119	3.008240	2.531747
Tanzania	3.00	3.165119	3.008240	2.531747
Colombia	3.00	3.165119	3.008240	2.531747
Vietnam	3.00	3.165119	3.008240	2.531747
Oko Caribe, batch 0719	3.25	3.414480	3.207410	2.718300
Venezuela, batch 107	3.25	3.414480	3.207410	2.718300
Camino Verde, Balao, Guayas	3.50	3.335919	3.721598	2.728386
Sambirano	3.50	3.335919	3.721598	2.728386
Carre Amer	3.00	3.163897	2.881324	2.467575
Los Ancones P.	3.00	3.163897	2.881324	2.467575
Hawai'i Island, Kona Estate, Hualalai Mtn	3.00	3.163897	2.881324	2.467575
Papua New Guinea	3.50	3.338643	3.418031	2.687520
Papua New Guinea	3.00	3.160147	3.060240	2.576516
Vale do Juliana E., Atlantic Forest	3.50	3.340897	3.390076	2.718300
Bahia, Floresta Azul, Good Friends Reserve#3	3.50	3.341447	3.532340	2.721420
Namau Village, N. Taileva P., batch a2812	3.25	3.408352	3.359084	2.735249
Djua Island, batch 1712	3.25	3.408352	3.359084	2.735249
Maranon, nano-lot #709, bar# 371	3.25	3.407925	3.425964	2.701026
Sambirano	2.75	2.906963	3.092198	2.429308
Ecuador	2.75	2.906963	3.092198	2.429308
Vanuatu, batch 2410	3.00	3.156178	3.087836	2.704635
Ecuador	3.00	3.156178	3.087836	2.704635
Belize, 2013	3.00	3.156178	3.087836	2.704635
Bundibugyo	3.00	3.156178	3.087836	2.704635
Puerto Rico	2.75	2.594758	2.941208	2.520262
Namau Village, N. Taileva P., batch a2812	3.50	3.344786	3.276322	2.730869
Djua Island, batch 1712	3.50	3.344786	3.276322	2.730869
Ecuador	3.25	3.094799	3.580201	2.607242
Cuba	3.25	3.094799	3.580201	2.607242
Maranon, Cajamarca, batch 002	3.00	3.154743	2.883141	2.675683
Lam Dong	3.50	3.345812	3.206587	2.735249
Lachua, Q'egchi families	3.50	3.345812	3.206587	2.735249
Ecuador	2.50	2.653585	2.950635	2.504316
Ecuador, 2013	3.00	3.153254	2.849317	2.675683
Moho River Valley	3.00	3.153254	2.849317	2.675683
Bahia Black, batch bra50722.1	3.50	3.347007	3.299028	2.735249
Tien Giang, Black S., batch VIT60420.0	3.50	3.347007	3.299028	2.735249
Downtown London	3.00	3.152370	3.299449	2.703631
Amazonas	3.00	3.152370	3.299449	2.703631

specific_bean_origin_or_bar_name	actual	linear	rf	boosted
Tabasco, Agrofloresta Cacao, 2020 h., batch 20098	3.50	3.351007	3.452082	2.717868
Esmeraldas	2.75	2.601344	2.473458	2.330227
Ecuador, batch 6-5-15	3.25	3.101416	3.271927	2.704635
Asajaya E, NW Borneo, b. #132/4500	3.00	3.147776	3.329607	2.695832
Hispaniola, batch 170104	3.00	3.147776	3.329607	2.695832
Sambirano, batch 170102	3.00	3.147776	3.329607	2.695832
New Ireland, batch 1702	3.25	3.396334	3.235201	2.731774
Puerto Rico	3.25	3.396334	3.235201	2.731774
Dominican Republic	3.25	3.396334	3.235201	2.731774
Winak Coop, Napo	3.50	3.355395	3.646651	2.757824
Tien Giang	3.50	3.355395	3.646651	2.757824
Chuncho-Cuzco	3.50	3.355936	3.485412	2.724528
Piura, Norandino coop, cacao blanco	3.50	3.355936	3.485412	2.724528
Wild Tranquilidad, harvest 2018, batch 9	3.50	3.356443	3.135480	2.605049
Guasare, Rosario de Perija, b.4279-GUA201123	3.50	3.356443	3.135480	2.605049
Piura	3.25	3.392984	3.438916	2.762966
Chanchamayo Province	3.25	3.392984	3.438916	2.762966
Rizek Cacao, batch DR 12	3.25	3.392984	3.438916	2.762966
Madagascar w/ nibs	3.00	2.857791	2.980625	2.393807
Idukki	3.25	3.391685	3.564425	2.731697
Maya Mountain	3.00	3.141442	3.232893	2.559176
Camino Verde, Balao, Guayas	3.50	3.358688	3.331914	2.721087
Sambirano	3.50	3.358688	3.331914	2.721087
Jamaique	3.25	3.386324	3.654437	2.767172
El Oro, Hacienda de Oro	3.25	3.115187	3.203313	2.607286
Autumn, Primary Harvest, 2012	3.50	3.365439	3.457644	2.757824
Sambirano	3.25	3.115823	3.264409	2.675683
Moho Valley	3.25	3.115823	3.264409	2.675683
Maya Mtn	3.25	3.115929	3.152440	2.543214
Patanemo	3.25	3.116655	3.191380	2.533452
Guatemala	3.25	3.116655	3.191380	2.533452
Tanzania	3.25	3.116655	3.191380	2.533452
Colombia	3.25	3.116655	3.191380	2.533452
Vietnam	3.25	3.116655	3.191380	2.533452
Diego 48hr/ W.F. blend prototype	2.75	2.882450	2.592365	2.396466
Puerto Plata	3.00	3.131463	3.102589	2.561071
Manabi	3.00	3.131463	3.102589	2.561071
Paquibao E., 2016	3.50	3.368915	3.335151	2.731697
South Cotabato	3.50	3.368915	3.335151	2.731697
Saloy E., 2016	3.50	3.368915	3.335151	2.731697
Hacienda Azul, 2017 harvest	3.50	3.369174	3.437436	2.727500
Camino Verde, 2017 harvest	3.50	3.369174	3.437436	2.727500
Silvestre, La Paz, Beni	3.25	3.380685	3.370613	2.719490
San Juan Estate, Gran Couva	3.25	3.380685	3.370613	2.719490
Los Colorados, Santo Domingo, Equateur	3.25	3.380212	3.220385	2.745224
Manabi	3.25	3.380212	3.220385	2.745224
Silvestre, La Paz, Beni	3.25	3.119900	3.184773	2.624864
San Juan Estate, Gran Couva	3.25	3.119900	3.184773	2.624864
Brazil	3.00	3.129042	3.048721	2.565822
Alto Beni	3.00	3.129042	3.048721	2.565822
Rio Caribe, Macuro	3.00	3.127331	3.419219	2.649198
Madagascar	3.00	3.127331	3.419219	2.649198

specific_bean_origin_or_bar_name	actual	linear	rf	boosted
Rio Caribe, Paria Peninsula	3.00	3.127331	3.419219	2.649198
Monte Alegre, Diego Badero	3.50	3.374842	3.379623	2.653494
The Other One, Grand Cru	3.00	3.124940	3.008194	2.538015
Wild Thing	3.00	3.124940	3.008194	2.538015
La Red	3.00	3.123745	3.005882	2.538015
La Red	3.00	3.123745	3.005882	2.538015
Ucayali, 2017 h., batch PU024	3.25	3.127039	3.139510	2.532174
Amazonas	3.25	3.127039	3.139510	2.532174
Piura	3.25	3.127039	3.139510	2.532174
Ghana	3.00	3.118755	3.175646	2.664973
Carribean	2.75	2.868537	2.819062	2.433361
Carribean-Raw	2.75	2.868537	2.819062	2.433361
Jamaica, #206, DR, LC	3.50	3.381605	3.369073	2.677070
Jamaica, #205, DR, MC	3.50	3.381605	3.369073	2.677070
Carenero Superior, #203, MR, SC	3.50	3.381605	3.369073	2.677070
Zorzal, batch 8	3.25	3.132353	3.326964	2.541994
Cordoba	3.25	3.367383	3.511117	2.735249
Cesar, CCN51	3.25	3.367383	3.511117	2.735249
Puerto Cabello, Mantuano	3.25	3.132828	3.032778	2.561965
Puerto Cabello, Criollo	3.25	3.133199	3.275687	2.704635
Camino Verde P., Balao, Guayas, "Fruity"	3.25	3.133199	3.275687	2.704635
Camino Verde P., Balao, Guayas, "Floral"	3.25	3.133199	3.275687	2.704635
Costa Rica	3.25	3.134273	3.045099	2.540840
Kokoa Kamili	3.25	3.134273	3.045099	2.540840
A case of the Xerces Blues, triple roast	3.50	3.384455	3.459054	2.721420
Maya Mountain	2.75	2.864501	3.195150	2.487375
Arauca	3.25	3.138601	3.269304	2.555408
Meta	3.25	3.138601	3.269304	2.555408
Winak Coop, Napo	3.50	3.390490	3.570671	2.735249
Tien Giang	3.50	3.390490	3.570671	2.735249
Asochivite, 2017 harvest	3.50	3.391548	3.460553	2.752968
Granella	3.25	3.356950	2.928969	2.609482
Vila Gracinda	3.25	3.356950	2.928969	2.609482
Nibby	3.25	3.356950	2.928969	2.609482
Nativo, Varzea	3.50	3.395004	3.282876	2.718300
Selvagem, Jari	3.50	3.395004	3.282876	2.718300
Venezuela	3.50	3.395004	3.282876	2.718300
Nicaragua, lot N510	3.50	3.395004	3.282876	2.718300
Ba Ria Vung Tau Province	3.25	3.147357	3.270401	2.717780
Patanemo	3.25	3.147357	3.270401	2.717780
Peru	3.50	3.398416	3.495560	2.757824
Madagascar	3.50	3.398416	3.495560	2.757824
Dak Nong, Marou Cacao	3.00	3.101377	2.985853	2.539700
Tenende, Uwate	3.25	3.350739	3.267946	2.729844
Dominican Republic, rustic	3.25	3.350739	3.267946	2.729844
Kilombero Valley	3.00	2.899517	2.960653	2.511479
Tumaco	3.00	3.098237	2.970097	2.531183
Ben Tre, batch 77	3.25	3.152747	3.339928	2.691692
O'Payo	3.25	3.152747	3.339928	2.691692
Ecuador	3.25	3.347122	3.483475	2.712627
Piura Blanco, 2018 harvest	3.50	3.403710	3.279126	2.715829
Soconusco	3.25	3.153851	3.193528	2.600761

specific_bean_origin_or_bar_name	actual	linear	rf	boosted
Monte Grande, batch 18	3.00	3.094989	3.012308	2.527204
Tumaco, batch 23abc	3.00	3.094989	3.012308	2.527204
Bolivia, batch 85	3.25	3.344617	3.048622	2.735249
La Dalia	3.25	3.344617	3.048622	2.735249
Sur del Lago	3.50	3.405793	2.996198	2.639948
Sambirano Valley, #216, MR, LC	3.50	3.405793	2.996198	2.639948
Peru, Ecuador	3.50	3.405793	2.996198	2.639948
Marcial, single Cote, 2012	3.25	3.343422	3.176592	2.735249
Toledo District	3.25	3.343422	3.176592	2.735249
Java	3.25	3.343422	3.176592	2.735249
Kokoa Kamili. Lot 73T	3.50	3.407581	3.246138	2.712627
Maranon, 2017 harvest	3.25	3.340801	3.407573	2.740287
Jamaica	3.00	3.089954	3.473812	2.630819
Ecuator	3.00	3.089954	3.473812	2.630819
Ecuador	3.00	2.911979	3.047880	2.581039
Cusco, Cacao Cusco	3.50	3.413182	3.566682	2.767172
Libanio	3.50	3.413182	3.566682	2.767172
Vietnam	2.75	2.835967	3.104027	2.562650
Taino Secret	3.25	3.335888	3.497040	2.731774
Carenero, Empyrean Sabor	3.25	3.335888	3.497040	2.731774
Dominican Republic	3.25	3.334063	3.275738	2.721087
Trinidad & Tobago	3.25	3.334063	3.275738	2.721087
Tien Giang	3.00	3.083219	3.015194	2.534230
Peru, batch P116	3.25	3.332604	3.490110	2.757824
Maya Mountain	3.25	3.167614	3.329232	2.719490
Bolivia	3.25	3.167614	3.329232	2.719490
Wasatch	3.25	3.167614	3.329232	2.719490
La Bahia, w/ cane sugar	3.25	3.329675	3.431439	2.731774
Costa Rica	3.25	3.329675	3.431439	2.731774
San Martin	3.25	3.170561	3.226706	2.675683
Conacado	3.25	3.170561	3.226706	2.675683
La Red de Guanconejo, N. Highlands coop	3.25	3.170561	3.226706	2.675683
Jamaica	3.25	3.171881	3.308702	2.578798
Ecuador	3.00	2.924015	3.315313	2.495689
Misterio, Colombia, Ecuador	3.00	2.924015	3.315313	2.495689
Granella	3.00	3.075282	2.856988	2.487050
Vila Gracinda	3.00	3.075282	2.856988	2.487050
Nibby	3.00	3.075282	2.856988	2.487050
Nicaragua, w/ inbs	3.00	3.074967	3.052369	2.541598
Dominican Republic	3.00	3.074967	3.052369	2.541598
Pisa	3.50	3.425340	3.348877	2.718300
Chef's Blend	3.25	3.175662	3.283551	2.642647
Patanemo	3.25	3.175662	3.283551	2.642647
Maracaibo, El Vigia	3.25	3.175662	3.283551	2.642647
Paramaribo, batch 20160043-01	3.25	3.323104	3.174657	2.719490
Midnight, Central and S. America	2.75	2.677056	2.988385	2.490246
Patanemo	3.25	3.177091	3.043148	2.675683
Guatemala	3.25	3.177091	3.043148	2.675683
Tanzania	3.25	3.177091	3.043148	2.675683
Colombia	3.25	3.177091	3.043148	2.675683
Vietnam	3.25	3.177091	3.043148	2.675683
Malah Na Bulong	3.25	3.177173	3.396622	2.715938

specific_bean_origin_or_bar_name	actual	linear	rf	boosted
Cordoba	3.50	3.429024	3.481820	2.735249
Cesar, CCN51	3.50	3.429024	3.481820	2.735249
Shake Shack, Peru, Mad., Dom. Rep.	3.25	3.320318	3.165934	2.711001
Madagascar	3.25	3.320318	3.165934	2.711001
Mindanao Island	3.25	3.181140	3.275561	2.703131
Malekula Island	3.25	3.181140	3.275561	2.703131
Patanemo	3.00	3.067358	2.733815	2.519558
Guatemala	3.00	3.067358	2.733815	2.519558
Tanzania	3.00	3.067358	2.733815	2.519558
Colombia	3.00	3.067358	2.733815	2.519558
Vietnam	3.00	3.067358	2.733815	2.519558
Dark 75, Ghana, Domin. Rep	3.00	2.936573	2.961313	2.468284
San Martin	3.00	2.936573	2.961313	2.468284
Rio Caribe	3.00	2.936573	2.961313	2.468284
Cacao Blanco	3.25	3.186641	3.337407	2.565822
Tumbes Coop, batch 120724M	3.25	3.188627	3.217614	2.644268
Kongo, Highlands	3.25	3.188627	3.217614	2.644268
Hacienda la Trinidad	3.25	3.188913	3.318815	2.576516
Johe, Xoco	3.25	3.188967	3.351278	2.565822
Kokoa Kamili	3.00	3.060453	2.911453	2.513717
Brazil	3.25	3.189641	3.307636	2.703631
Zorzal Reserva	3.00	3.059581	3.084941	2.532174
Piura Blanco, Norandino	3.00	3.059581	3.084941	2.532174
Belize, batch 26	3.25	3.191788	3.167167	2.675683
Vanuatu, batch 2410	3.25	3.191788	3.167167	2.675683
Ecuador	3.25	3.191788	3.167167	2.675683
Belize, 2013	3.25	3.191788	3.167167	2.675683
Bundibugyo	3.25	3.191788	3.167167	2.675683
Peru	3.00	3.057305	3.294896	2.587298
Peru	3.00	3.057305	3.294896	2.587298
Costa Esmeraldas	3.25	3.307131	3.434876	2.731774
Liberia, batch 174	3.25	3.193396	3.371371	2.691248
Talamanca, Raul-Kekoldo community	3.25	3.306017	3.154716	2.712627
Oro	3.25	3.306017	3.154716	2.712627
Grenada	3.25	3.195252	3.716446	2.728684
Chuno, 3x turned	3.50	3.446103	3.492394	2.731697
Sang Yum Coop	2.75	2.802426	2.889063	2.216722
Morropon, Norandiono Coop, Piura	3.50	3.449637	3.523514	2.731774
Arauca	3.25	3.299541	3.471076	2.757824
Tingo Maria	3.25	3.299541	3.471076	2.757824
West Africa	3.25	3.200931	2.981451	2.613103
Tawau, Borneo Island	3.25	3.201616	3.140153	2.691692
Samar, East Visayas region	3.25	3.297078	3.575726	2.757824
Santo Domingo	3.25	3.297078	3.575726	2.757824
Dark 75, Ghana, Domin. Rep	3.25	3.204595	3.377963	2.669113
San Martin	3.25	3.204595	3.377963	2.669113
Rio Caribe	3.25	3.204595	3.377963	2.669113
Jamaica, #206, DR, LC	3.25	3.205703	3.204770	2.633695
Jamaica, #205, DR, MC	3.25	3.205703	3.204770	2.633695
Carenero Superior, #203, MR, SC	3.25	3.205703	3.204770	2.633695
Esmeraldas	3.25	3.206668	2.880344	2.735983
Mexico	3.25	3.291816	2.969812	2.711635

specific_bean_origin_or_bar_name	actual	linear	rf	boosted
Alto Beni, Palos Blanco	3.25	3.291808	3.423246	2.721420
Porcelana	3.25	3.291808	3.423246	2.721420
Porcelana, Batch 5163	3.25	3.291808	3.423246	2.721420
Guatemala	3.25	3.208874	3.393381	2.719490
Vale do Juliana, w/ nibs	3.25	3.211493	3.371828	2.718300
Morropon, Piura, AoC Golden Bean 2018	3.25	3.288340	3.272656	2.566219
Ucayali	3.25	3.288340	3.272656	2.566219
Maranon	3.25	3.212459	3.140634	2.715938
Lachua, Cacao Verapaz	3.25	3.212459	3.140634	2.715938
Grand Cru Ecuador	3.25	3.213263	3.326888	2.742064
Satipo Pangoa region, 20hr conche	3.25	3.213263	3.326888	2.742064
Mekong Delta	3.25	3.213952	3.118251	2.711635
Sambirano, Rieur, Ambanja	3.25	3.213952	3.118251	2.711635
San Martin	3.00	3.035741	3.212937	2.532174
Conacado	3.00	3.035741	3.212937	2.532174
La Red de Guanconejo, N. Highlands coop	3.00	3.035741	3.212937	2.532174
Ocumare, Cumboto, batch 16	3.25	3.285243	3.149167	2.566393
Amazonas, batch 14	3.25	3.285243	3.149167	2.566393
Hawai'i Island, Hawaiian Crown, Kona Vanilla	3.25	3.285243	3.149167	2.566393
Macuare; Miranda; Chloe formula, H. La Trinidad	3.25	3.215203	3.069079	2.691692
Chuao, Aragua region, H. La Trinidad	3.25	3.215203	3.069079	2.691692
Peru, Batch 1	3.25	3.278600	3.404251	2.731774
Los Colorados, Santo Domingo, Equateur	3.25	3.221539	3.459517	2.712627
Manabi	3.25	3.221539	3.459517	2.712627
Cooproagro	3.00	3.028345	3.169711	2.614419
Camino Verde, Guayas	3.00	3.028345	3.169711	2.614419
Upala	3.25	3.276268	2.937921	2.711635
Chuao, batch 20170714C	3.25	3.276268	2.937921	2.711635
Liberia	3.25	3.275873	3.710978	2.719490
Ecuador	3.00	2.974193	3.470571	2.649198
Cuba	3.00	2.974193	3.470571	2.649198
Upala	3.00	3.025510	2.959718	2.505237
Chuao, batch 20170714C	3.00	3.025510	2.959718	2.505237
La Dalia, Lazy Growers Blend	3.25	3.275073	3.601573	2.731697
Indio Rojo	3.25	3.275073	3.601573	2.731697
Phantom	3.25	3.275059	3.353788	2.718300
El Carmen, batch 1003	3.25	3.275059	3.353788	2.718300
Oscuro, Finca Chimelb	3.25	3.225035	3.380683	2.719490
Bundibugyo District	3.25	3.225292	3.320687	2.590618
Camino Verde, Black S., batch cvu6030.0	3.25	3.225292	3.320687	2.590618
Sao Tome, batch TRI-18-002, trinitario	3.25	3.272414	3.346303	2.717868
Papouasie	3.25	3.272414	3.346303	2.717868
Maya Mountain, 2017, batch 255	3.25	3.272414	3.346303	2.717868
Taino Secret	3.25	3.271304	3.694093	2.731774
Carenero, Empyrean Sabor	3.25	3.271304	3.694093	2.731774
Ucayali	3.25	3.271015	3.548258	2.715938
Maya Mountain, Toledo District, batch 12-1	3.25	3.271015	3.548258	2.715938
Pisa	3.25	3.270233	3.448638	2.721420
Kilombero	3.25	3.270233	3.448638	2.721420
Tan Phu Dong Island, Heart of Darkness	3.25	3.230370	3.291470	2.712627
Sao Tome, batch TRI-18-002, trinitario	3.00	3.018741	2.931051	2.524821
Papouasie	3.00	3.018741	2.931051	2.524821

specific_bean_origin_or_bar_name	actual	linear	rf	boosted
Maya Mountain, 2017, batch 255	3.00	3.018741	2.931051	2.524821
Choroni, Finca Torres, 48hr c.	3.25	3.231508	3.401378	2.589608
Dominican Republic	3.25	3.233269	3.505717	2.729844
Onyx	3.25	3.233269	3.505717	2.729844
Upala, Batch 18	3.25	3.233269	3.505717	2.729844
Nicaragua, batch 164	3.25	3.233461	3.243583	2.691248
IL100, H. San Jose, batch NDL3A01	3.25	3.233461	3.243583	2.691248
Chanchamayo, Pichanadi, 2012, 60hr c., b.13092	3.25	3.233461	3.243583	2.691248
Java, Indonesian Black	3.25	3.233461	3.243583	2.691248
Belize	3.25	3.234656	3.282223	2.691248
Tingo Maria	3.25	3.264825	3.313822	2.716370
Kokoa Kamili	3.25	3.264825	3.313822	2.716370
Kilombero Valley	3.00	2.987030	3.069010	2.486328
Trinidad	3.00	2.987048	3.074765	2.551154
Bejofo	3.50	3.487889	3.353388	2.761558
Cuyagua, batch 4, lot DC2.3	3.50	3.487889	3.353388	2.761558
Choba Choba	3.50	3.487889	3.353388	2.761558
La Red, Guaconejo	3.25	3.238049	3.395688	2.729844
Patovaki, Paspaskato Is	3.25	3.259181	3.114171	2.721087
Akesson Estate	3.25	3.241312	3.403153	2.675683
Rio Caribe, Macuro	3.50	3.508458	3.402396	2.723133
Madagascar	3.50	3.508458	3.402396	2.723133
Rio Caribe, Paria Penninsula	3.50	3.508458	3.402396	2.723133
Sambirano	3.25	3.258316	3.144232	2.664973
Ecuador	3.25	3.258316	3.144232	2.664973
Hacienda Azul, 2017 harvest	3.25	3.256522	3.439740	2.717868
Camino Verde, 2017 harvest	3.25	3.256522	3.439740	2.717868
Chiapas	3.25	3.255327	3.458300	2.717868
El Oro	3.00	3.004623	3.063248	2.570646
Santo Domingo	3.00	3.004623	3.063248	2.570646
Johe	3.00	2.995943	2.712312	2.325064
Camino Verde P., Balao, Guayas, 2012	3.00	2.995943	2.712312	2.325064
Nicaragua	3.25	3.246550	3.501125	2.719490
Tien Giang	3.25	3.252938	3.442893	2.721420
Maya Mtn	3.25	3.252938	3.442893	2.721420
Patanemo	3.00	2.998327	3.135525	2.575463
Guatemala	3.00	2.998327	3.135525	2.575463
Tanzania	3.00	2.998327	3.135525	2.575463
Colombia	3.00	2.998327	3.135525	2.575463
Vietnam	3.00	2.998327	3.135525	2.575463
Bambamarca, 2015	3.25	3.250741	3.391370	2.681471
Ecuador	3.25	3.250741	3.391370	2.681471
Venezuela	3.00	2.999772	3.008613	2.515630