

Sales_USDA_linear

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Data

We have included Bayer National Brand corn seed sales data from 2006 - 2020. We have also included USDA in-season projection data for acres planted in the United states. For reasons described in the next section, the next iteration of the linear model will include $y + 1$ USDA projections for acres planted.

Base results

We need to document the results for the linear model. We have included the growing envelope and sliding window techniques. The predictions are made with and without using USDA projections as predictors. Note, the models that use September and October data only need to use $y+1$ projections from the USDA because we are unable to get USDA projections until early November. This has not yet been implemented. The models are currently using in-season USDA projections.

Growing envelope technique

Growing Envelope September Sales without USDA projections

	results
MAE	2.29
MAPE	2.50
RMSE	3.99

Growing Envelope September Sales with USDA projections

	results
MAE	2.12
MAPE	2.32
RMSE	3.86

Growing Envelope September/October Sales without USDA projections

	results
MAE	2.26
MAPE	2.47
RMSE	4.02

Growing Envelope September October Sales with USDA projections

	results
MAE	2.12
MAPE	2.32
RMSE	3.91

Growing Envelope SepOctNov Sales without USDA projections

	results
MAE	2.17
MAPE	2.39
RMSE	4.00

Growing Envelope SepOctNov Sales with USDA projections

	results
MAE	2.51
MAPE	2.76
RMSE	4.15

Moving Window Technique

Moving Window September Sales without USDA projections

	window_4	window_5	window_6	window_7	window_8	window_9
MAE	3.7	2.75	2.96	3.22	2.54	2.10
MAPE	4.0	3.01	3.26	3.55	2.81	2.29
RMSE	4.3	3.27	3.17	3.51	2.79	2.23

Moving Window September Sales with USDA projections

	window_4	window_5	window_6	window_7	window_8	window_9
MAE	4.50	3.58	3.24	4.31	4.07	2.58
MAPE	4.85	3.90	3.55	4.74	4.49	2.82
RMSE	6.02	5.72	5.24	6.43	6.40	3.08

Moving Window September/October Sales without USDA projections

	window_4	window_5	window_6	window_7	window_8	window_9
MAE	3.91	3.32	2.30	2.74	1.83	1.76
MAPE	4.24	3.60	2.53	3.02	2.01	1.91
RMSE	4.76	4.02	2.79	3.41	2.39	2.40

Moving Window September October Sales with USDA projections

	window_4	window_5	window_6	window_7	window_8	window_9
MAE	4.60	3.71	2.50	3.32	2.51	2.86
MAPE	4.96	4.02	2.76	3.64	2.77	3.11
RMSE	5.76	4.71	3.52	4.53	3.51	3.92

Moving Window SepOctNov Sales without USDA projections

	window_4	window_5	window_6	window_7	window_8	window_9
MAE	3.16	2.76	2.32	2.50	1.84	1.42
MAPE	3.43	3.02	2.55	2.76	2.03	1.54
RMSE	3.87	3.27	2.79	3.17	2.49	1.81

Moving Window SepOctNov Sales with USDA projections

	window_4	window_5	window_6	window_7	window_8	window_9
MAE	5.85	3.66	2.41	2.62	2.21	1.54
MAPE	6.39	4.01	2.66	2.90	2.47	1.68
RMSE	8.58	4.42	3.02	3.46	3.04	1.81