

# Supplemental Appendix in support of PAPER TITLE

Subodh Adhikari, Sanford Eigenbrode, Erich Seamon

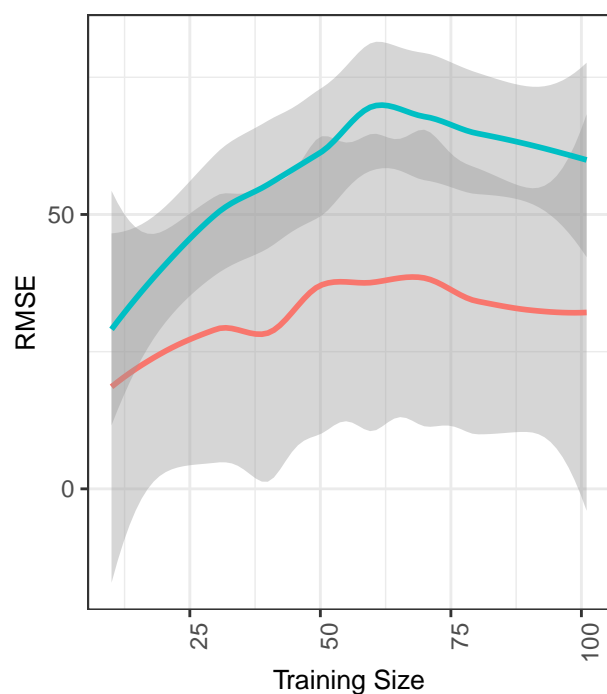
10/22/2021

## Contents

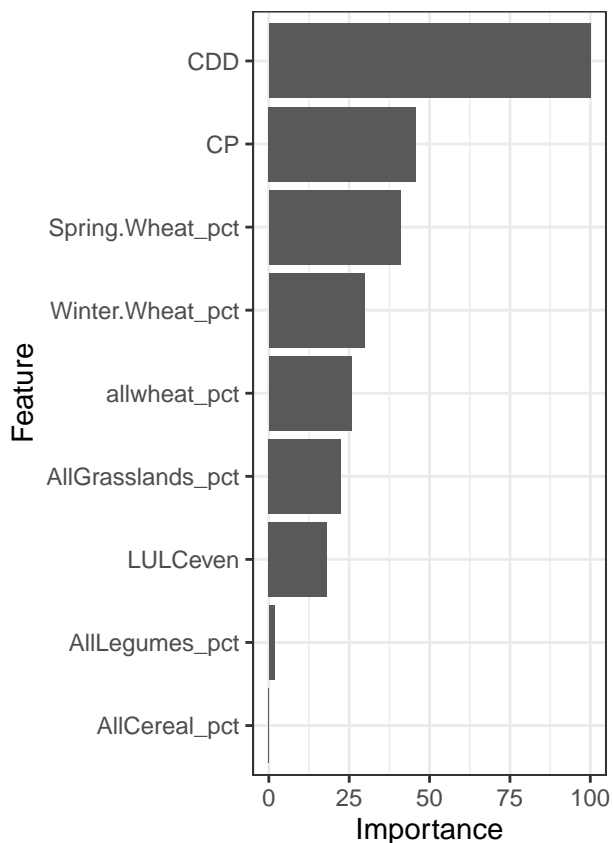
Total Aphids Model . . . . .	2
Total Aphids No Mfc Model . . . . .	3
Relative Abundance Mfc Model . . . . .	4
Individual Aphids: Rp . . . . .	5
Individual Aphids: Sa . . . . .	6
Individual Aphids: Md . . . . .	7
Individual Aphids: Mfc . . . . .	8

## Total Aphids Model

### Learning Curve Analysis



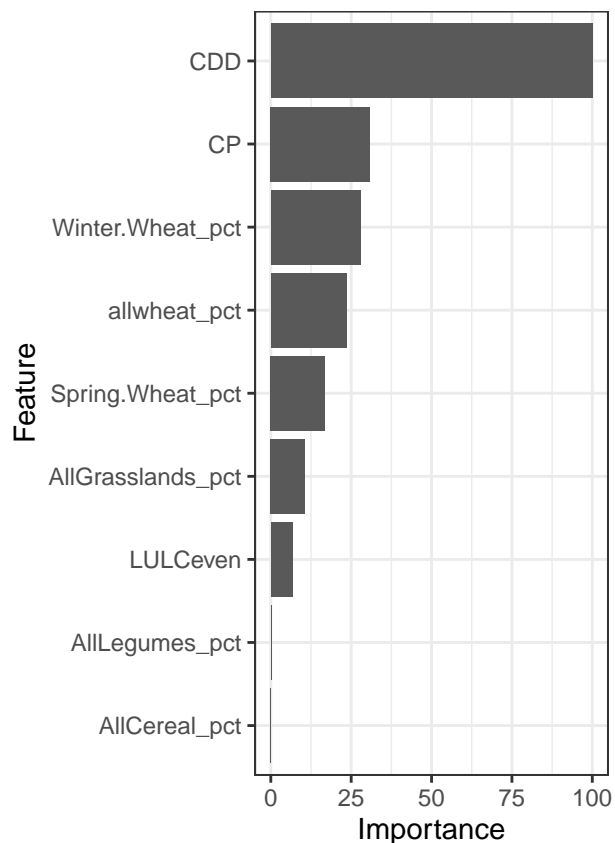
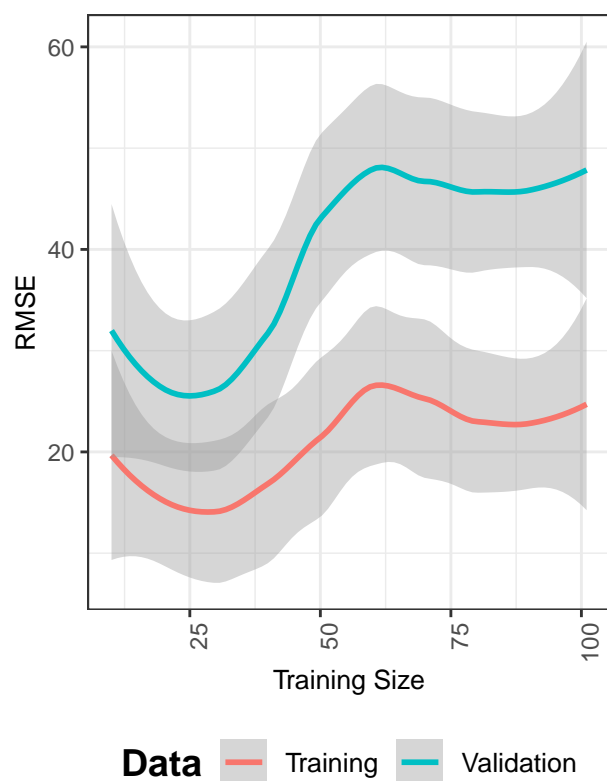
**Data** — Training — Validation



```
## Random Forest
##
## 101 samples
## 9 predictors
##
## No pre-processing
## Resampling: Cross-Validated (10 fold, repeated 1 times)
## Summary of sample sizes: 89, 90, 92, 91, 91, 90, ...
## Resampling results across tuning parameters:
##
##  mtry  RMSE      Rsquared  MAE
##  2      64.78268  0.1569018  48.76875
##  5      67.57931  0.1608612  50.15996
##  9      68.57751  0.1598344  49.98162
##
## RMSE was used to select the optimal model using the smallest value.
## The final value used for the model was mtry = 2.
```

## Total Aphids No Mfc Model

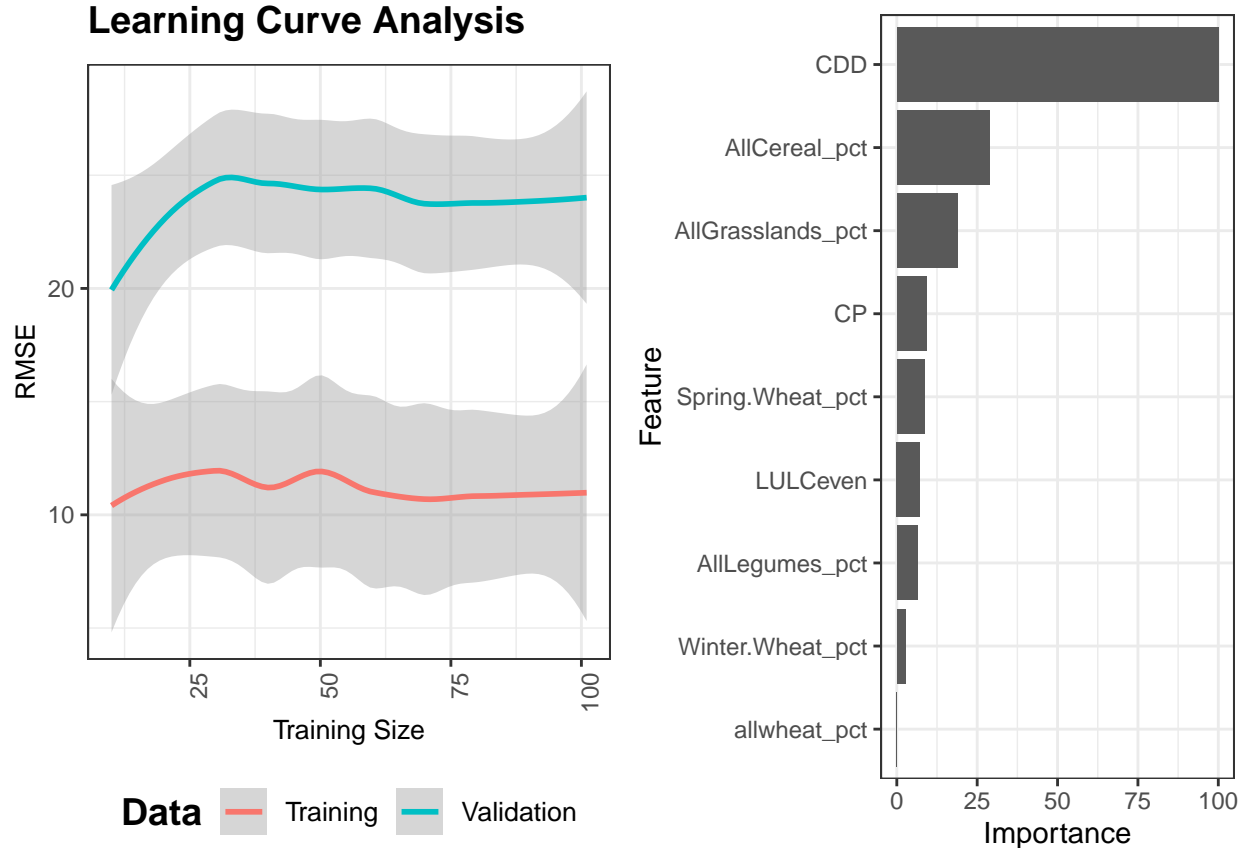
### Learning Curve Analysis



```
## Random Forest
##
## 101 samples
## 9 predictors
##
## No pre-processing
## Resampling: Cross-Validated (10 fold, repeated 1 times)
## Summary of sample sizes: 89, 90, 92, 91, 91, 90, ...
## Resampling results across tuning parameters:
##
## mtry RMSE      Rsquared  MAE
## 2     48.75631  0.2699527 36.01342
## 5     49.21273  0.2534876 35.60269
## 9     49.64269  0.2447464 35.43093
##
## RMSE was used to select the optimal model using the smallest value.
## The final value used for the model was mtry = 2.
```

## Relative Abundance Mfc Model

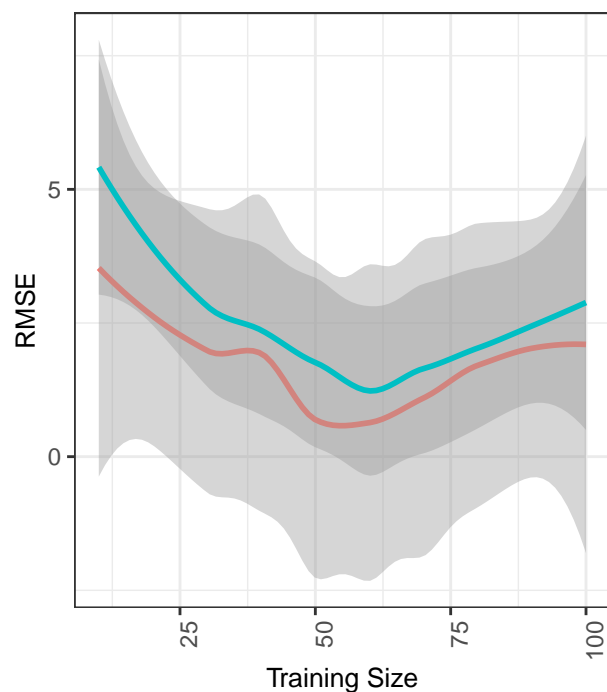
### Learning Curve Analysis



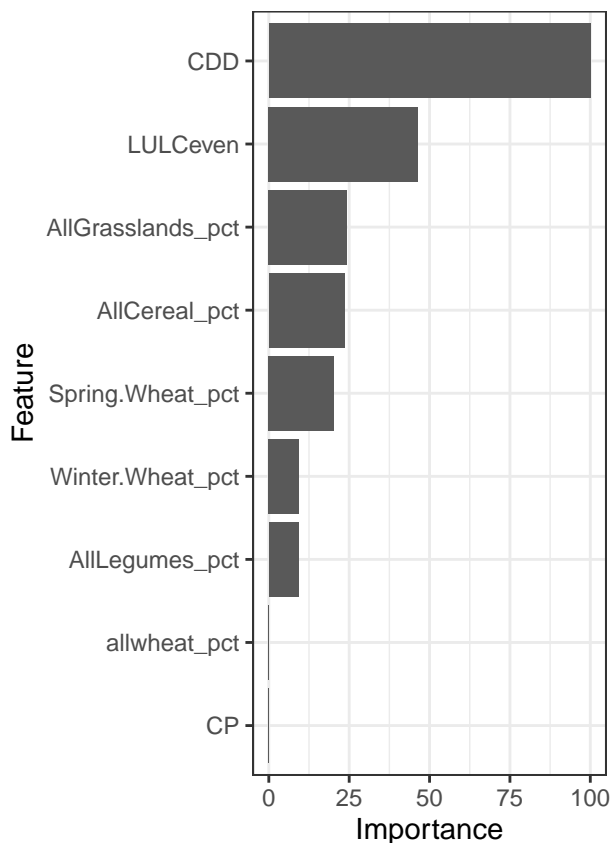
```
## Random Forest
##
## 101 samples
## 9 predictors
##
## No pre-processing
## Resampling: Cross-Validated (10 fold, repeated 1 times)
## Summary of sample sizes: 89, 90, 92, 91, 91, 90, ...
## Resampling results across tuning parameters:
##
## mtry RMSE      Rsquared MAE
## 2    24.04913  0.2080817  20.31317
## 5    24.37890  0.2457944  20.53565
## 9    25.11418  0.2213461  21.11501
##
## RMSE was used to select the optimal model using the smallest value.
## The final value used for the model was mtry = 2.
```

## Individual Aphids: Rp

### Learning Curve Analysis

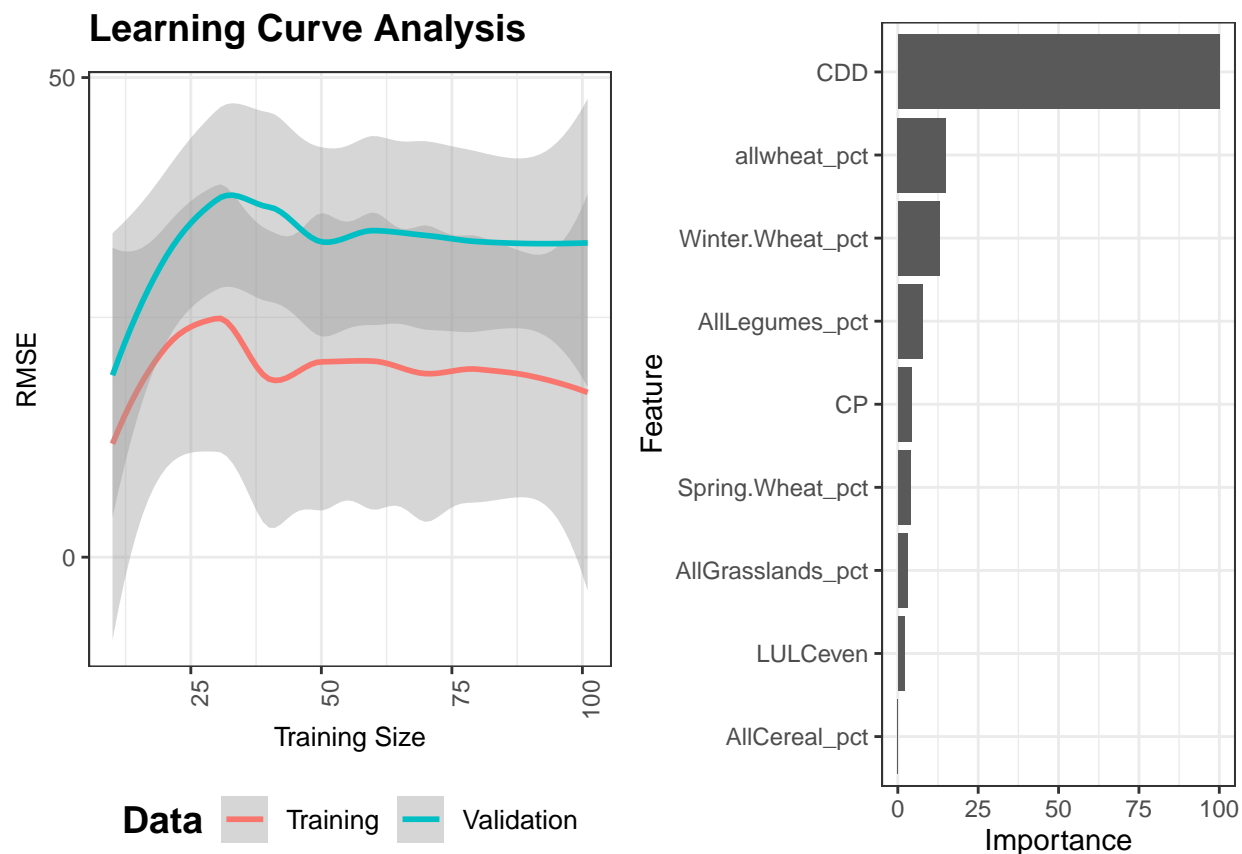


**Data** Training Validation



```
## Random Forest
##
## 100 samples
## 9 predictors
##
## No pre-processing
## Resampling: Cross-Validated (10 fold, repeated 1 times)
## Summary of sample sizes: 89, 91, 90, 89, 91, 90, ...
## Resampling results across tuning parameters:
##
## mtry RMSE Rsquared MAE
## 2 2.501708 0.08506083 1.610710
## 5 2.529702 0.10604945 1.573597
## 9 2.711837 0.17160733 1.617458
##
## RMSE was used to select the optimal model using the smallest value.
## The final value used for the model was mtry = 2.
```

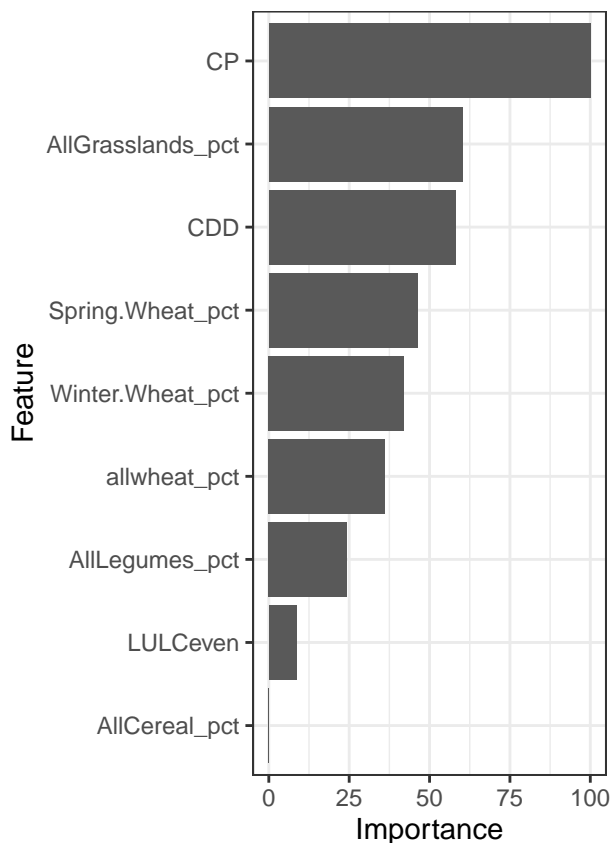
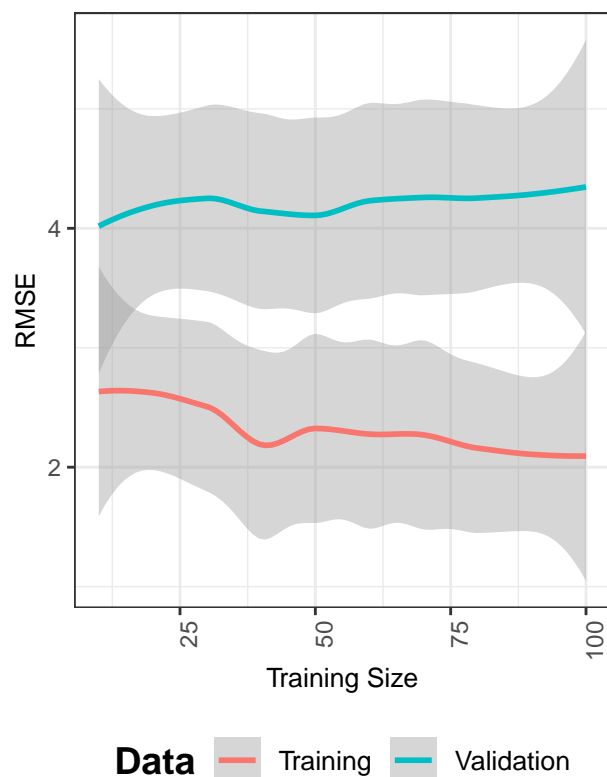
## Individual Aphids: Sa



```
## Random Forest
##
## 101 samples
## 9 predictors
##
## No pre-processing
## Resampling: Cross-Validated (10 fold, repeated 1 times)
## Summary of sample sizes: 89, 90, 92, 91, 91, 90, ...
## Resampling results across tuning parameters:
##
## mtry  RMSE      Rsquared  MAE
## 2      32.31825  0.4945743  21.97183
## 5      31.49266  0.5162830  21.30232
## 9      32.89967  0.5052096  21.91088
##
## RMSE was used to select the optimal model using the smallest value.
## The final value used for the model was mtry = 5.
```

## Individual Aphids: Md

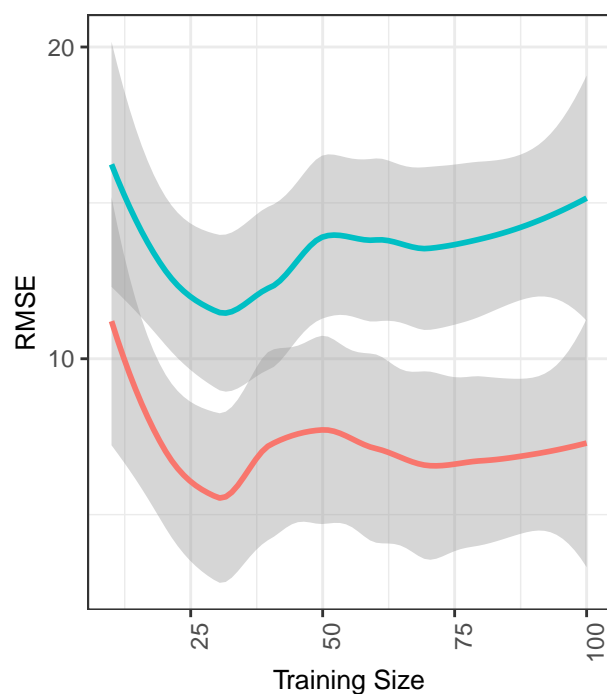
### Learning Curve Analysis



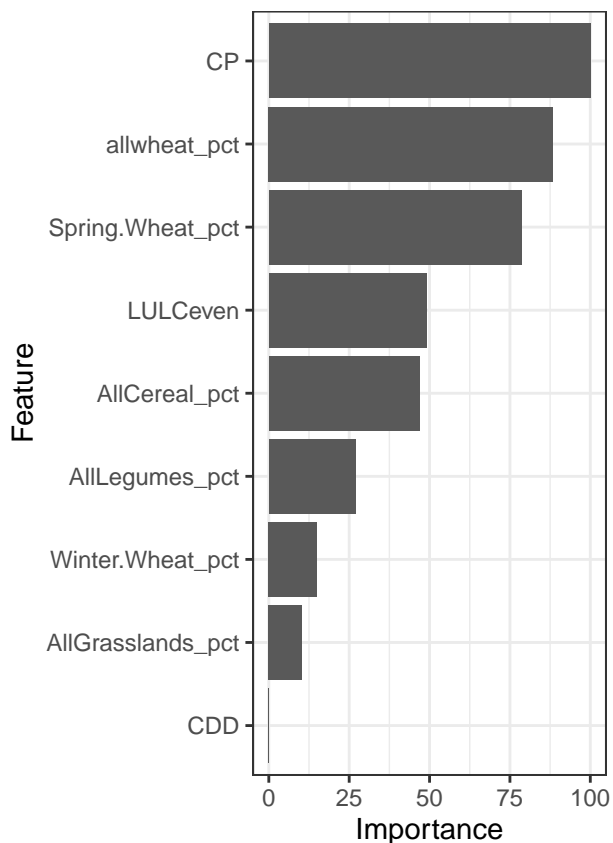
```
## Random Forest
##
## 100 samples
## 9 predictors
##
## No pre-processing
## Resampling: Cross-Validated (10 fold, repeated 1 times)
## Summary of sample sizes: 90, 89, 89, 89, 91, 90, ...
## Resampling results across tuning parameters:
##
## mtry RMSE      Rsquared  MAE
## 2    4.337734  0.2476065  3.381242
## 5    4.391711  0.2258709  3.449717
## 9    4.434257  0.2141594  3.506636
##
## RMSE was used to select the optimal model using the smallest value.
## The final value used for the model was mtry = 2.
```

## Individual Aphids: Mfc

### Learning Curve Analysis



**Data** Training Validation



```
## Random Forest
##
## 100 samples
## 9 predictors
##
## No pre-processing
## Resampling: Cross-Validated (10 fold, repeated 1 times)
## Summary of sample sizes: 90, 89, 89, 90, 90, 91, ...
## Resampling results across tuning parameters:
##
## mtry  RMSE      Rsquared  MAE
## 2     14.85645  0.1558217  11.95953
## 5     15.29274  0.1427161  12.43366
## 9     15.46483  0.1482640  12.59967
##
## RMSE was used to select the optimal model using the smallest value.
## The final value used for the model was mtry = 2.
```



