**2. Write a program to implement naïve Bayesian classification**

**OUTPUT:**

=== Run information ===

Scheme: weka.classifiers.bayes.NaiveBayes

Relation: soybean

Instances: 683

Attributes: 36

date

plant-stand

precip

temp

hail

crop-hist

area-damaged

severity

seed-tmt

germination

plant-growth

leaves

leafspots-halo

leafspots-marg

leafspot-size

leaf-shread

leaf-malf

leaf-mild

stem

lodging

stem-cankers

canker-lesion

fruiting-bodies

external-decay

mycelium

int-discolor

sclerotia

fruit-pods

fruit-spots

seed

mold-growth

seed-discolor

seed-size

shriveling

roots

class

Test mode: 10-fold cross-validation

=== Classifier model (full training set) ===

Naive Bayes Classifier

Class

Attribute diaporthe-stem-canker charcoal-rot rhizoctonia-root-rot phytophthora-rot brown-stem-rot powdery-mildew downy-mildew brown-spot bacterial-blight bacterial-pustule purple-seed-stain anthracnose phyllosticta-leaf-spot alternarialeaf-spot frog-eye-leaf-spot diaporthe-pod-&-stem-blight cyst-nematode 2-4-d-injury herbicide-injury

(0.03) (0.03) (0.03) (0.13) (0.06) (0.03) (0.03) (0.13) (0.03) (0.03) (0.03) (0.06) (0.03) (0.13) (0.13) (0.02) (0.02) (0.02) (0.01)

===========================================================================================================================================================================================================================================================================================================================================================================================================================================================================================================================================================================

date

april 1.0 1.0 7.0 8.0 1.0 1.0 1.0 6.0 1.0 1.0 1.0 3.0 1.0 1.0 1.0 1.0 1.0 4.0 4.0

may 1.0 1.0 7.0 24.0 1.0 4.0 3.0 28.0 1.0 3.0 1.0 3.0 4.0 1.0 1.0 3.0 1.0 3.0 4.0

june 1.0 1.0 7.0 26.0 1.0 4.0 5.0 29.0 4.0 8.0 1.0 3.0 9.0 1.0 1.0 1.0 4.0 3.0 3.0

july 6.0 4.0 2.0 28.0 9.0 3.0 5.0 18.0 8.0 8.0 5.0 3.0 8.0 4.0 14.0 1.0 7.0 3.0 1.0

august 6.0 6.0 2.0 7.0 18.0 5.0 5.0 9.0 8.0 3.0 6.0 8.0 3.0 19.0 34.0 1.0 6.0 3.0 1.0

september 6.0 7.0 1.0 1.0 17.0 5.0 5.0 8.0 4.0 3.0 6.0 18.0 1.0 41.0 32.0 8.0 1.0 3.0 1.0

october 6.0 7.0 1.0 1.0 4.0 5.0 3.0 1.0 1.0 1.0 7.0 13.0 1.0 31.0 15.0 7.0 1.0 3.0 1.0

[total] 27.0 27.0 27.0 95.0 51.0 27.0 27.0 99.0 27.0 27.0 27.0 51.0 27.0 98.0 98.0 22.0 21.0 22.0 15.0

plant-stand

normal 21.0 21.0 3.0 1.0 34.0 10.0 10.0 58.0 16.0 12.0 21.0 22.0 10.0 59.0 64.0 8.0 1.0 1.0 1.0

lt-normal 1.0 1.0 19.0 89.0 12.0 12.0 12.0 36.0 6.0 10.0 1.0 24.0 12.0 34.0 29.0 3.0 1.0 1.0 9.0

[total] 22.0 22.0 22.0 90.0 46.0 22.0 22.0 94.0 22.0 22.0 22.0 46.0 22.0 93.0 93.0 11.0 2.0 2.0 10.0

precip

lt-norm 1.0 21.0 1.0 1.0 36.0 11.0 1.0 1.0 1.0 1.0 1.0 1.0 10.0 1.0 1.0 1.0 1.0 1.0 1.0

norm 1.0 1.0 1.0 31.0 10.0 10.0 1.0 11.0 11.0 13.0 1.0 1.0 12.0 10.0 11.0 3.0 1.0 1.0 1.0

gt-norm 21.0 1.0 21.0 59.0 1.0 2.0 21.0 83.0 11.0 9.0 21.0 45.0 1.0 83.0 82.0 14.0 1.0 1.0 1.0

[total] 23.0 23.0 23.0 91.0 47.0 23.0 23.0 95.0 23.0 23.0 23.0 47.0 23.0 94.0 94.0 18.0 3.0 3.0 3.0

temp

lt-norm 1.0 1.0 21.0 10.0 14.0 11.0 9.0 1.0 1.0 6.0 8.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 9.0

norm 21.0 6.0 1.0 52.0 26.0 11.0 10.0 83.0 18.0 12.0 8.0 34.0 11.0 41.0 55.0 1.0 1.0 1.0 1.0

gt-norm 1.0 16.0 1.0 29.0 7.0 1.0 4.0 11.0 4.0 5.0 7.0 12.0 11.0 52.0 38.0 16.0 1.0 1.0 1.0

[total] 23.0 23.0 23.0 91.0 47.0 23.0 23.0 95.0 23.0 23.0 23.0 47.0 23.0 94.0 94.0 18.0 3.0 3.0 11.0

hail

yes 20.0 10.0 19.0 15.0 36.0 12.0 12.0 82.0 11.0 11.0 12.0 34.0 12.0 82.0 82.0 1.0 1.0 1.0 1.0

no 2.0 12.0 3.0 7.0 10.0 10.0 10.0 12.0 11.0 11.0 10.0 12.0 10.0 11.0 11.0 1.0 1.0 1.0 1.0

[total] 22.0 22.0 22.0 22.0 46.0 22.0 22.0 94.0 22.0 22.0 22.0 46.0 22.0 93.0 93.0 2.0 2.0 2.0 2.0

crop-hist

diff-lst-year 1.0 4.0 6.0 7.0 1.0 6.0 3.0 3.0 3.0 4.0 6.0 6.0 6.0 12.0 6.0 3.0 1.0 1.0 5.0

same-lst-yr 7.0 6.0 6.0 21.0 11.0 6.0 7.0 18.0 7.0 7.0 6.0 14.0 6.0 21.0 28.0 4.0 3.0 1.0 5.0

same-lst-two-yrs 8.0 7.0 6.0 33.0 17.0 6.0 7.0 38.0 7.0 7.0 6.0 14.0 6.0 31.0 30.0 5.0 8.0 1.0 1.0

same-lst-sev-yrs 8.0 7.0 6.0 31.0 19.0 6.0 7.0 37.0 7.0 6.0 6.0 14.0 6.0 31.0 31.0 7.0 6.0 1.0 1.0

[total] 24.0 24.0 24.0 92.0 48.0 24.0 24.0 96.0 24.0 24.0 24.0 48.0 24.0 95.0 95.0 19.0 18.0 4.0 12.0

area-damaged

scattered 18.0 1.0 1.0 1.0 12.0 6.0 6.0 8.0 6.0 6.0 6.0 6.0 8.0 19.0 24.0 3.0 1.0 5.0 5.0

low-areas 4.0 1.0 21.0 88.0 3.0 6.0 6.0 18.0 6.0 6.0 6.0 14.0 1.0 26.0 24.0 1.0 9.0 5.0 1.0

upper-areas 1.0 11.0 1.0 1.0 18.0 6.0 6.0 18.0 6.0 6.0 6.0 14.0 8.0 25.0 23.0 1.0 7.0 5.0 1.0

whole-field 1.0 11.0 1.0 2.0 15.0 6.0 6.0 52.0 6.0 6.0 6.0 14.0 7.0 25.0 24.0 14.0 1.0 4.0 5.0

[total] 24.0 24.0 24.0 92.0 48.0 24.0 24.0 96.0 24.0 24.0 24.0 48.0 24.0 95.0 95.0 19.0 18.0 19.0 12.0

severity

minor 1.0 1.0 1.0 1.0 1.0 11.0 7.0 12.0 11.0 13.0 21.0 12.0 15.0 54.0 49.0 1.0 1.0 1.0 1.0

pot-severe 15.0 21.0 10.0 8.0 38.0 11.0 15.0 76.0 11.0 9.0 1.0 32.0 7.0 39.0 44.0 1.0 1.0 1.0 1.0

severe 7.0 1.0 12.0 14.0 8.0 1.0 1.0 7.0 1.0 1.0 1.0 3.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0

[total] 23.0 23.0 23.0 23.0 47.0 23.0 23.0 95.0 23.0 23.0 23.0 47.0 23.0 94.0 94.0 3.0 3.0 3.0 3.0

seed-tmt

none 12.0 11.0 17.0 11.0 23.0 11.0 11.0 64.0 11.0 15.0 13.0 22.0 11.0 43.0 45.0 1.0 1.0 1.0 1.0

fungicide 10.0 11.0 5.0 11.0 23.0 7.0 11.0 16.0 11.0 7.0 9.0 20.0 9.0 44.0 43.0 1.0 1.0 1.0 1.0

other 1.0 1.0 1.0 1.0 1.0 5.0 1.0 15.0 1.0 1.0 1.0 5.0 3.0 7.0 6.0 1.0 1.0 1.0 1.0

[total] 23.0 23.0 23.0 23.0 47.0 23.0 23.0 95.0 23.0 23.0 23.0 47.0 23.0 94.0 94.0 3.0 3.0 3.0 3.0

germination

90-100 4.0 7.0 1.0 8.0 16.0 8.0 1.0 28.0 8.0 2.0 3.0 16.0 6.0 31.0 36.0 6.0 1.0 1.0 1.0

80-89 10.0 8.0 11.0 8.0 16.0 8.0 11.0 34.0 9.0 11.0 10.0 20.0 9.0 32.0 29.0 3.0 1.0 1.0 1.0

lt-80 9.0 8.0 11.0 7.0 15.0 7.0 11.0 33.0 6.0 10.0 10.0 11.0 8.0 31.0 29.0 3.0 1.0 1.0 1.0

[total] 23.0 23.0 23.0 23.0 47.0 23.0 23.0 95.0 23.0 23.0 23.0 47.0 23.0 94.0 94.0 12.0 3.0 3.0 3.0

plant-growth

norm 1.0 1.0 1.0 1.0 25.0 21.0 21.0 84.0 17.0 18.0 21.0 33.0 17.0 92.0 88.0 16.0 1.0 1.0 1.0

abnorm 21.0 21.0 21.0 89.0 21.0 1.0 1.0 10.0 5.0 4.0 1.0 13.0 5.0 1.0 5.0 1.0 15.0 1.0 9.0

[total] 22.0 22.0 22.0 90.0 46.0 22.0 22.0 94.0 22.0 22.0 22.0 46.0 22.0 93.0 93.0 17.0 16.0 2.0 10.0

leaves

norm 1.0 1.0 20.0 1.0 11.0 1.0 1.0 1.0 1.0 1.0 10.0 25.0 1.0 1.0 1.0 16.0 1.0 1.0 1.0

abnorm 21.0 21.0 2.0 89.0 35.0 21.0 21.0 93.0 21.0 21.0 12.0 21.0 21.0 92.0 92.0 1.0 15.0 17.0 9.0

[total] 22.0 22.0 22.0 90.0 46.0 22.0 22.0 94.0 22.0 22.0 22.0 46.0 22.0 93.0 93.0 17.0 16.0 18.0 10.0

leafspots-halo

absent 21.0 21.0 21.0 34.0 36.0 21.0 1.0 1.0 1.0 1.0 10.0 45.0 1.0 1.0 1.0 1.0 1.0 17.0 5.0

yellow-halos 1.0 1.0 1.0 1.0 1.0 1.0 11.0 1.0 11.0 17.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0

no-yellow-halos 1.0 1.0 1.0 1.0 10.0 1.0 11.0 93.0 11.0 5.0 12.0 1.0 21.0 92.0 92.0 1.0 1.0 1.0 5.0

[total] 23.0 23.0 23.0 36.0 47.0 23.0 23.0 95.0 23.0 23.0 23.0 47.0 23.0 94.0 94.0 3.0 3.0 19.0 11.0

leafspots-marg

w-s-marg 1.0 1.0 1.0 1.0 10.0 1.0 21.0 93.0 21.0 4.0 12.0 1.0 21.0 92.0 92.0 1.0 1.0 1.0 1.0

no-w-s-marg 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 18.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 5.0

dna 21.0 21.0 21.0 34.0 36.0 21.0 1.0 1.0 1.0 1.0 10.0 45.0 1.0 1.0 1.0 1.0 1.0 17.0 5.0

[total] 23.0 23.0 23.0 36.0 47.0 23.0 23.0 95.0 23.0 23.0 23.0 47.0 23.0 94.0 94.0 3.0 3.0 19.0 11.0

leafspot-size

lt-1/8 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 21.0 21.0 12.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0

gt-1/8 1.0 1.0 1.0 1.0 10.0 1.0 21.0 93.0 1.0 1.0 1.0 1.0 21.0 92.0 92.0 1.0 1.0 1.0 5.0

dna 21.0 21.0 21.0 34.0 36.0 21.0 1.0 1.0 1.0 1.0 10.0 45.0 1.0 1.0 1.0 1.0 1.0 17.0 5.0

[total] 23.0 23.0 23.0 36.0 47.0 23.0 23.0 95.0 23.0 23.0 23.0 47.0 23.0 94.0 94.0 3.0 3.0 19.0 11.0

leaf-shread

absent 21.0 21.0 21.0 34.0 45.0 21.0 21.0 49.0 4.0 7.0 21.0 45.0 11.0 81.0 92.0 1.0 1.0 1.0 9.0

present 1.0 1.0 1.0 1.0 1.0 1.0 1.0 45.0 18.0 15.0 1.0 1.0 11.0 12.0 1.0 1.0 1.0 1.0 1.0

[total] 22.0 22.0 22.0 35.0 46.0 22.0 22.0 94.0 22.0 22.0 22.0 46.0 22.0 93.0 93.0 2.0 2.0 2.0 10.0

leaf-malf

absent 21.0 21.0 21.0 34.0 45.0 21.0 15.0 93.0 19.0 18.0 21.0 45.0 11.0 92.0 92.0 1.0 1.0 1.0 1.0

present 1.0 1.0 1.0 1.0 1.0 1.0 7.0 1.0 3.0 4.0 1.0 1.0 11.0 1.0 1.0 1.0 1.0 17.0 9.0

[total] 22.0 22.0 22.0 35.0 46.0 22.0 22.0 94.0 22.0 22.0 22.0 46.0 22.0 93.0 93.0 2.0 2.0 18.0 10.0

leaf-mild

absent 21.0 21.0 21.0 34.0 45.0 1.0 1.0 93.0 21.0 21.0 21.0 45.0 21.0 92.0 92.0 1.0 1.0 1.0 1.0

upper-surf 1.0 1.0 1.0 1.0 1.0 21.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0

lower-surf 1.0 1.0 1.0 1.0 1.0 1.0 21.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0

[total] 23.0 23.0 23.0 36.0 47.0 23.0 23.0 95.0 23.0 23.0 23.0 47.0 23.0 94.0 94.0 3.0 3.0 3.0 3.0

stem

norm 1.0 1.0 1.0 1.0 1.0 21.0 21.0 55.0 21.0 21.0 12.0 1.0 21.0 92.0 27.0 1.0 15.0 1.0 1.0

abnorm 21.0 21.0 21.0 89.0 45.0 1.0 1.0 39.0 1.0 1.0 10.0 45.0 1.0 1.0 66.0 16.0 1.0 1.0 9.0

[total] 22.0 22.0 22.0 90.0 46.0 22.0 22.0 94.0 22.0 22.0 22.0 46.0 22.0 93.0 93.0 17.0 16.0 2.0 10.0

lodging

yes 15.0 18.0 19.0 19.0 29.0 21.0 21.0 93.0 21.0 21.0 16.0 40.0 21.0 92.0 89.0 1.0 1.0 1.0 1.0

no 7.0 4.0 3.0 3.0 17.0 1.0 1.0 1.0 1.0 1.0 6.0 6.0 1.0 1.0 4.0 1.0 1.0 1.0 1.0

[total] 22.0 22.0 22.0 22.0 46.0 22.0 22.0 94.0 22.0 22.0 22.0 46.0 22.0 93.0 93.0 2.0 2.0 2.0 2.0

stem-cankers

absent 1.0 21.0 1.0 7.0 45.0 21.0 21.0 60.0 21.0 21.0 21.0 1.0 21.0 92.0 25.0 16.0 1.0 1.0 1.0

below-soil 1.0 1.0 21.0 20.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0

above-soil 1.0 1.0 1.0 31.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 6.0 1.0 1.0 2.0 1.0 1.0 1.0 1.0

above-sec-nde 21.0 1.0 1.0 34.0 1.0 1.0 1.0 34.0 1.0 1.0 1.0 40.0 1.0 1.0 67.0 1.0 1.0 1.0 1.0

[total] 24.0 24.0 24.0 92.0 48.0 24.0 24.0 96.0 24.0 24.0 24.0 48.0 24.0 95.0 95.0 19.0 4.0 4.0 4.0

canker-lesion

dna 11.0 1.0 1.0 1.0 25.0 21.0 21.0 55.0 21.0 21.0 1.0 1.0 21.0 92.0 27.0 16.0 1.0 1.0 1.0

brown 11.0 1.0 21.0 1.0 1.0 1.0 1.0 34.0 1.0 1.0 1.0 11.0 1.0 1.0 11.0 1.0 1.0 1.0 1.0

dk-brown-blk 1.0 1.0 1.0 89.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 35.0 1.0 1.0 56.0 1.0 1.0 1.0 1.0

tan 1.0 21.0 1.0 1.0 21.0 1.0 1.0 6.0 1.0 1.0 21.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0

[total] 24.0 24.0 24.0 92.0 48.0 24.0 24.0 96.0 24.0 24.0 24.0 48.0 24.0 95.0 95.0 19.0 4.0 4.0 4.0

fruiting-bodies

absent 1.0 21.0 21.0 21.0 45.0 21.0 21.0 57.0 21.0 21.0 21.0 15.0 21.0 92.0 89.0 1.0 1.0 1.0 1.0

present 21.0 1.0 1.0 1.0 1.0 1.0 1.0 37.0 1.0 1.0 1.0 31.0 1.0 1.0 4.0 16.0 1.0 1.0 1.0

[total] 22.0 22.0 22.0 22.0 46.0 22.0 22.0 94.0 22.0 22.0 22.0 46.0 22.0 93.0 93.0 17.0 2.0 2.0 2.0

external-decay

absent 1.0 21.0 1.0 70.0 45.0 21.0 21.0 88.0 21.0 21.0 21.0 25.0 21.0 92.0 28.0 16.0 1.0 1.0 1.0

firm-and-dry 21.0 1.0 21.0 7.0 1.0 1.0 1.0 6.0 1.0 1.0 1.0 21.0 1.0 1.0 65.0 1.0 1.0 1.0 1.0

watery 1.0 1.0 1.0 14.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0

[total] 23.0 23.0 23.0 91.0 47.0 23.0 23.0 95.0 23.0 23.0 23.0 47.0 23.0 94.0 94.0 18.0 3.0 3.0 3.0

mycelium

absent 21.0 21.0 15.0 89.0 45.0 21.0 21.0 93.0 21.0 21.0 21.0 45.0 21.0 92.0 92.0 16.0 1.0 1.0 1.0

present 1.0 1.0 7.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0

[total] 22.0 22.0 22.0 90.0 46.0 22.0 22.0 94.0 22.0 22.0 22.0 46.0 22.0 93.0 93.0 17.0 2.0 2.0 2.0

int-discolor

none 21.0 1.0 21.0 89.0 1.0 21.0 21.0 93.0 21.0 21.0 21.0 45.0 21.0 92.0 92.0 16.0 1.0 1.0 1.0

brown 1.0 1.0 1.0 1.0 45.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0

black 1.0 21.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0

[total] 23.0 23.0 23.0 91.0 47.0 23.0 23.0 95.0 23.0 23.0 23.0 47.0 23.0 94.0 94.0 18.0 3.0 3.0 3.0

sclerotia

absent 21.0 1.0 21.0 89.0 45.0 21.0 21.0 93.0 21.0 21.0 21.0 45.0 21.0 92.0 92.0 16.0 1.0 1.0 1.0

present 1.0 21.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0

[total] 22.0 22.0 22.0 90.0 46.0 22.0 22.0 94.0 22.0 22.0 22.0 46.0 22.0 93.0 93.0 17.0 2.0 2.0 2.0

fruit-pods

norm 21.0 21.0 1.0 1.0 45.0 21.0 21.0 91.0 21.0 21.0 10.0 7.0 21.0 92.0 28.0 1.0 1.0 1.0 1.0

diseased 1.0 1.0 1.0 1.0 1.0 1.0 1.0 3.0 1.0 1.0 12.0 39.0 1.0 1.0 65.0 16.0 1.0 1.0 1.0

few-present 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 15.0 1.0 1.0

dna 1.0 1.0 21.0 21.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 9.0

[total] 24.0 24.0 24.0 24.0 48.0 24.0 24.0 96.0 24.0 24.0 24.0 48.0 24.0 95.0 95.0 19.0 18.0 4.0 12.0

fruit-spots

absent 1.0 1.0 1.0 1.0 25.0 21.0 21.0 89.0 21.0 21.0 10.0 7.0 21.0 92.0 28.0 1.0 1.0 1.0 1.0

colored 1.0 1.0 1.0 1.0 1.0 1.0 1.0 3.0 1.0 1.0 12.0 1.0 1.0 1.0 63.0 1.0 1.0 1.0 1.0

brown-w/blk-specks 1.0 1.0 1.0 1.0 1.0 1.0 1.0 3.0 1.0 1.0 1.0 39.0 1.0 1.0 3.0 16.0 1.0 1.0 1.0

distort 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0

dna 21.0 21.0 21.0 21.0 21.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0

[total] 25.0 25.0 25.0 25.0 49.0 25.0 25.0 97.0 25.0 25.0 25.0 49.0 25.0 96.0 96.0 20.0 5.0 5.0 5.0

seed

norm 21.0 21.0 21.0 21.0 45.0 21.0 1.0 93.0 21.0 11.0 1.0 18.0 21.0 82.0 90.0 4.0 1.0 1.0 1.0

abnorm 1.0 1.0 1.0 1.0 1.0 1.0 21.0 1.0 1.0 11.0 21.0 28.0 1.0 11.0 3.0 13.0 15.0 1.0 1.0

[total] 22.0 22.0 22.0 22.0 46.0 22.0 22.0 94.0 22.0 22.0 22.0 46.0 22.0 93.0 93.0 17.0 16.0 2.0 2.0

mold-growth

absent 21.0 21.0 21.0 21.0 45.0 21.0 1.0 93.0 21.0 11.0 21.0 23.0 21.0 92.0 92.0 1.0 15.0 1.0 1.0

present 1.0 1.0 1.0 1.0 1.0 1.0 21.0 1.0 1.0 11.0 1.0 23.0 1.0 1.0 1.0 16.0 1.0 1.0 1.0

[total] 22.0 22.0 22.0 22.0 46.0 22.0 22.0 94.0 22.0 22.0 22.0 46.0 22.0 93.0 93.0 17.0 16.0 2.0 2.0

seed-discolor

absent 21.0 21.0 21.0 21.0 45.0 21.0 21.0 93.0 21.0 11.0 1.0 37.0 21.0 82.0 91.0 1.0 1.0 1.0 1.0

present 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 11.0 21.0 9.0 1.0 11.0 2.0 16.0 1.0 1.0 1.0

[total] 22.0 22.0 22.0 22.0 46.0 22.0 22.0 94.0 22.0 22.0 22.0 46.0 22.0 93.0 93.0 17.0 2.0 2.0 2.0

seed-size

norm 21.0 21.0 21.0 21.0 45.0 21.0 21.0 93.0 21.0 14.0 21.0 23.0 21.0 92.0 91.0 1.0 1.0 1.0 1.0

lt-norm 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 8.0 1.0 23.0 1.0 1.0 2.0 16.0 15.0 1.0 1.0

[total] 22.0 22.0 22.0 22.0 46.0 22.0 22.0 94.0 22.0 22.0 22.0 46.0 22.0 93.0 93.0 17.0 16.0 2.0 2.0

shriveling

absent 21.0 21.0 21.0 21.0 45.0 21.0 21.0 93.0 21.0 21.0 21.0 23.0 21.0 92.0 91.0 1.0 1.0 1.0 1.0

present 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 23.0 1.0 1.0 2.0 16.0 1.0 1.0 1.0

[total] 22.0 22.0 22.0 22.0 46.0 22.0 22.0 94.0 22.0 22.0 22.0 46.0 22.0 93.0 93.0 17.0 2.0 2.0 2.0

roots

norm 21.0 21.0 20.0 21.0 45.0 21.0 21.0 93.0 21.0 11.0 21.0 45.0 21.0 92.0 92.0 1.0 1.0 1.0 1.0

rotted 1.0 1.0 2.0 69.0 1.0 1.0 1.0 1.0 1.0 10.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 9.0

galls-cysts 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 2.0 1.0 1.0 1.0 1.0 1.0 1.0 15.0 1.0 1.0

[total] 23.0 23.0 23.0 91.0 47.0 23.0 23.0 95.0 23.0 23.0 23.0 47.0 23.0 94.0 94.0 3.0 17.0 3.0 11.0

Time taken to build model: 0 seconds

=== Stratified cross-validation ===

=== Summary ===

Correctly Classified Instances 635 92.9722 %

Incorrectly Classified Instances 48 7.0278 %

Kappa statistic 0.923

Mean absolute error 0.0096

Root mean squared error 0.0817

Relative absolute error 9.9344 %

Root relative squared error 37.2742 %

Total Number of Instances 683

=== Detailed Accuracy By Class ===

TP Rate FP Rate Precision Recall F-Measure MCC ROC Area PRC Area Class

1.000 0.000 1.000 1.000 1.000 1.000 1.000 1.000 diaporthe-stem-canker

1.000 0.000 1.000 1.000 1.000 1.000 1.000 1.000 charcoal-rot

1.000 0.000 1.000 1.000 1.000 1.000 1.000 1.000 rhizoctonia-root-rot

1.000 0.003 0.978 1.000 0.989 0.987 1.000 1.000 phytophthora-rot

1.000 0.000 1.000 1.000 1.000 1.000 1.000 1.000 brown-stem-rot

1.000 0.000 1.000 1.000 1.000 1.000 1.000 1.000 powdery-mildew

1.000 0.000 1.000 1.000 1.000 1.000 1.000 1.000 downy-mildew

0.837 0.008 0.939 0.837 0.885 0.870 0.989 0.950 brown-spot

1.000 0.003 0.909 1.000 0.952 0.952 1.000 0.998 bacterial-blight

0.900 0.000 1.000 0.900 0.947 0.947 1.000 0.991 bacterial-pustule

1.000 0.000 1.000 1.000 1.000 1.000 1.000 1.000 purple-seed-stain

1.000 0.000 1.000 1.000 1.000 1.000 1.000 1.000 anthracnose

0.850 0.008 0.773 0.850 0.810 0.804 0.994 0.882 phyllosticta-leaf-spot

1.000 0.049 0.758 1.000 0.863 0.849 0.991 0.936 alternarialeaf-spot

0.714 0.007 0.942 0.714 0.813 0.798 0.980 0.907 frog-eye-leaf-spot

1.000 0.001 0.938 1.000 0.968 0.968 1.000 1.000 diaporthe-pod-&-stem-blight

1.000 0.000 1.000 1.000 1.000 1.000 1.000 1.000 cyst-nematode

0.875 0.000 1.000 0.875 0.933 0.934 1.000 1.000 2-4-d-injury

1.000 0.000 1.000 1.000 1.000 1.000 1.000 1.000 herbicide-injury

Weighted Avg. 0.930 0.009 0.938 0.930 0.929 0.923 0.994 0.969

=== Confusion Matrix ===

a b c d e f g h i j k l m n o p q r s <-- classified as

20 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | a = diaporthe-stem-canker

0 20 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | b = charcoal-rot

0 0 20 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | c = rhizoctonia-root-rot

0 0 0 88 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | d = phytophthora-rot

0 0 0 0 44 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | e = brown-stem-rot

0 0 0 0 0 20 0 0 0 0 0 0 0 0 0 0 0 0 0 | f = powdery-mildew

0 0 0 0 0 0 20 0 0 0 0 0 0 0 0 0 0 0 0 | g = downy-mildew

0 0 0 0 0 0 0 77 0 0 0 0 5 6 4 0 0 0 0 | h = brown-spot

0 0 0 0 0 0 0 0 20 0 0 0 0 0 0 0 0 0 0 | i = bacterial-blight

0 0 0 0 0 0 0 0 2 18 0 0 0 0 0 0 0 0 0 | j = bacterial-pustule

0 0 0 0 0 0 0 0 0 0 20 0 0 0 0 0 0 0 0 | k = purple-seed-stain

0 0 0 0 0 0 0 0 0 0 0 44 0 0 0 0 0 0 0 | l = anthracnose

0 0 0 0 0 0 0 2 0 0 0 0 17 1 0 0 0 0 0 | m = phyllosticta-leaf-spot

0 0 0 0 0 0 0 0 0 0 0 0 0 91 0 0 0 0 0 | n = alternarialeaf-spot

0 0 0 0 0 0 0 3 0 0 0 0 0 22 65 1 0 0 0 | o = frog-eye-leaf-spot

0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 15 0 0 0 | p = diaporthe-pod-&-stem-blight

0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 14 0 0 | q = cyst-nematode

0 0 0 2 0 0 0 0 0 0 0 0 0 0 0 0 0 14 0 | r = 2-4-d-injury

0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 8 | s = herbicide-injury