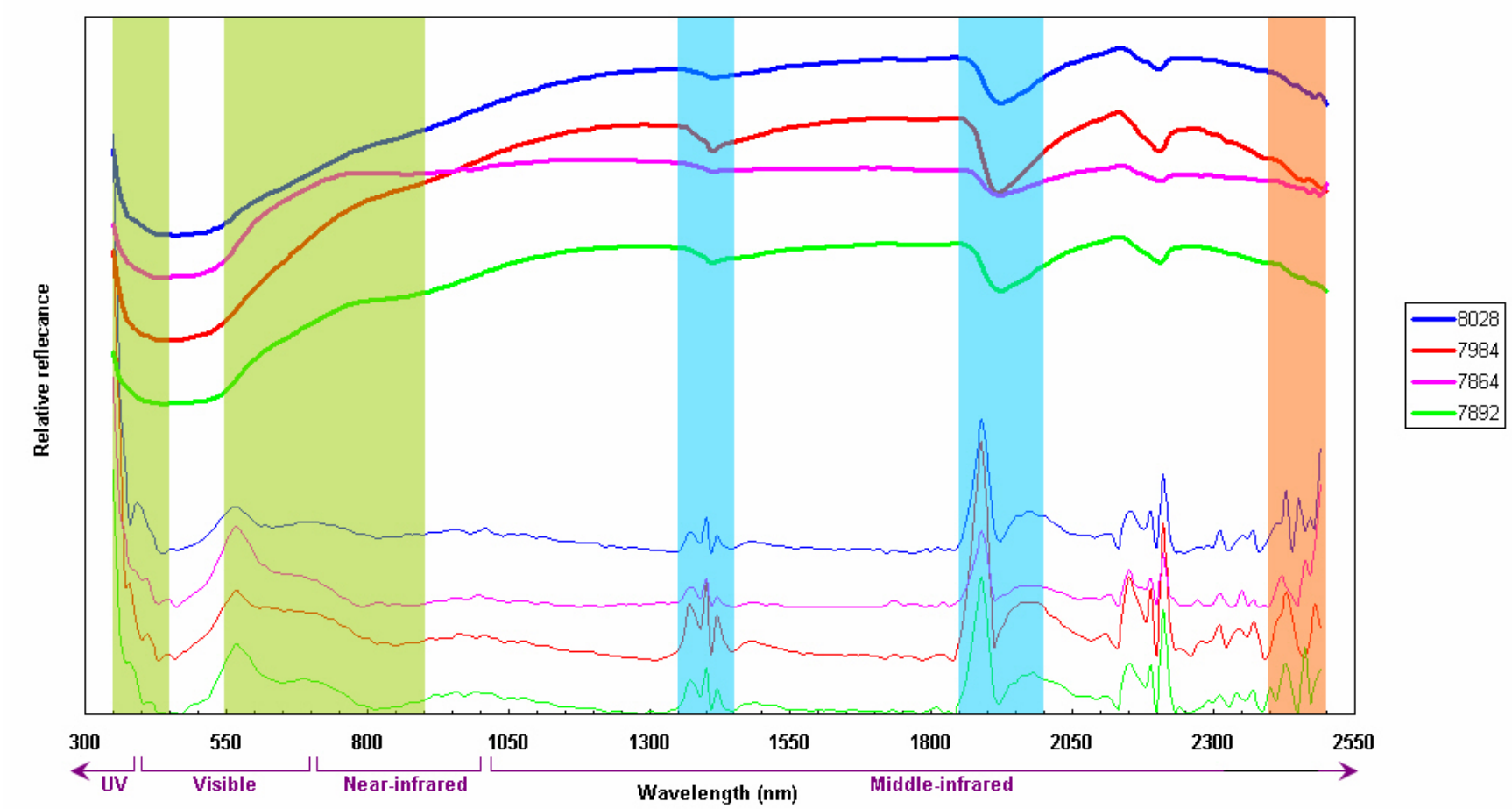

Figure 4.3.1 Spectral regions where variation among samples is greatest
* Thick line plots are stacked, relative reflectance for each sample; thin line plots are the absolute value of the first derivative times 100 for each sample. The area shaded in yellow represents regions variation in VNIR regions used to calibrate C_{org} and N; the blue area signifies H_2O/OH^- absorptions used to calibrate clay and K; the red area is also used to calibrate clay and K; lab-ID# indicated in legend.

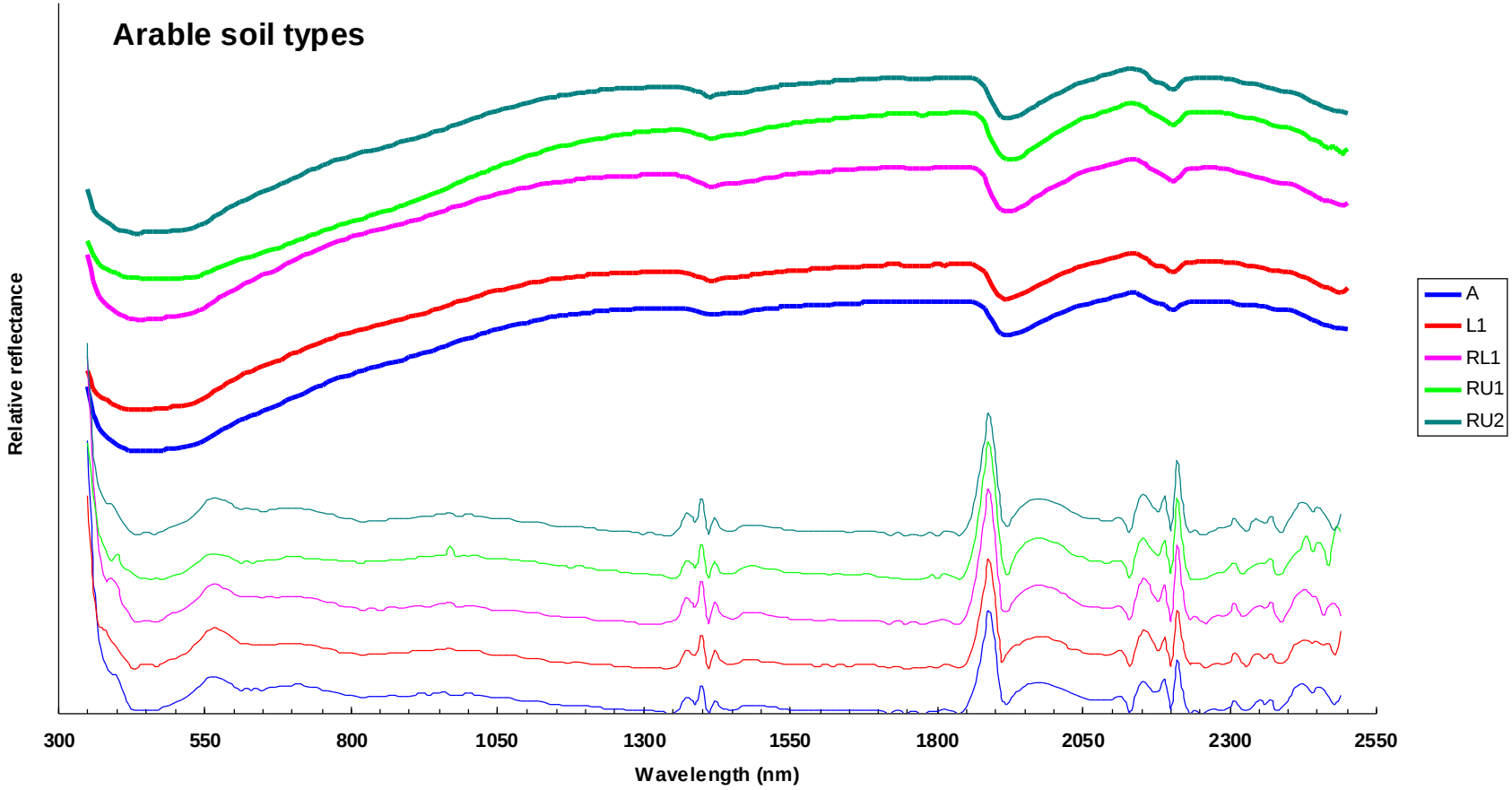

Figure 4.3.2 Spectral variation by soil type
* Thick line plots are stacked, relative reflectance for each sample; thin line plots are the absolute value of the first derivative times 100 for each sample. For each soil type, values have first been averaged within land use types before being averaged for the soil type to remove any land use bias.

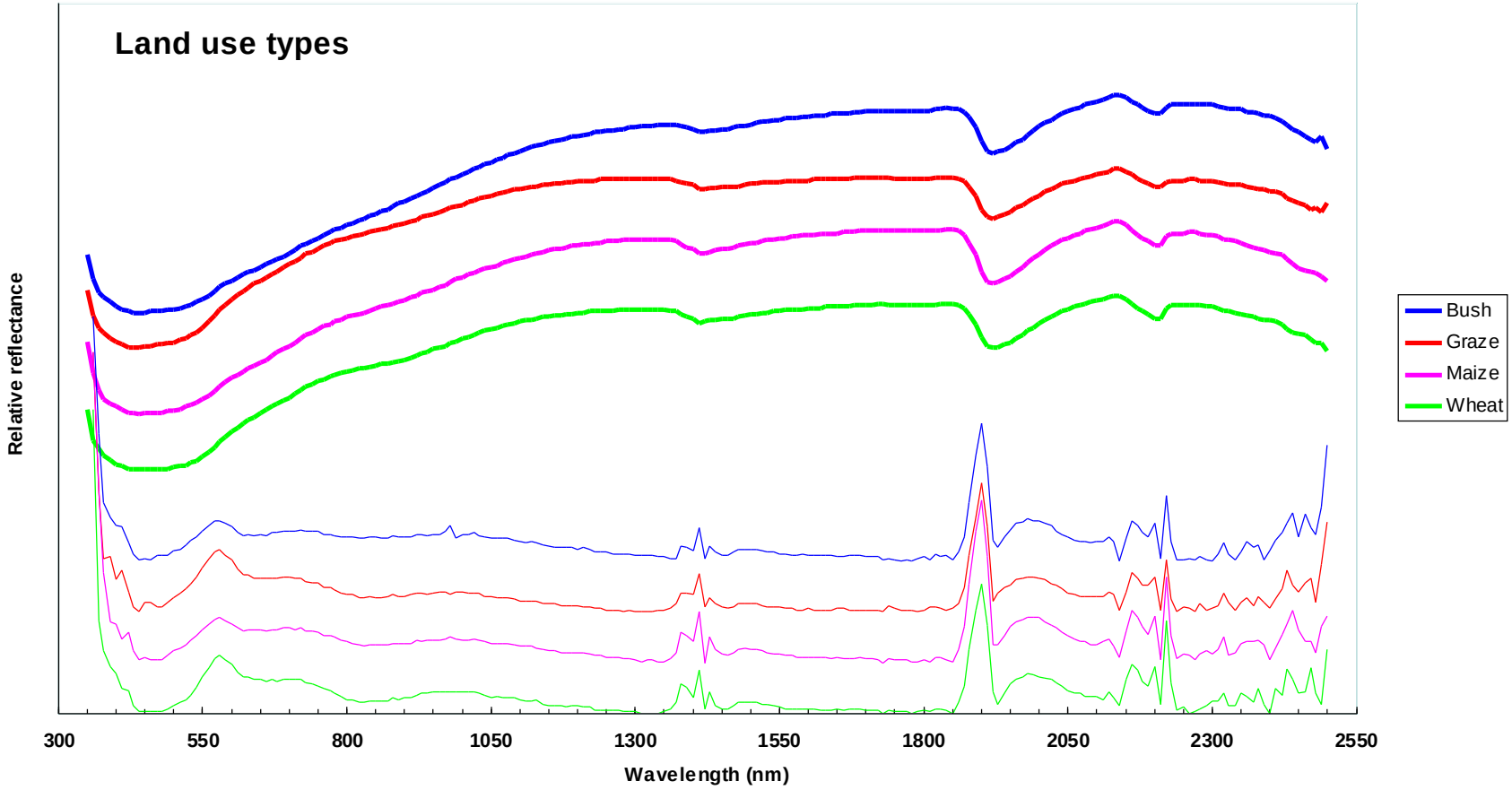

Figure 4.3.3 Spectral variation by land use type
* Thick line plots are stacked, relative reflectance for each sample; thin line plots are the absolute value of the first derivative times 100 for each sample. For each land use, values have first been averaged within soil types before being averaged for the land use type to remove any soil type bias.

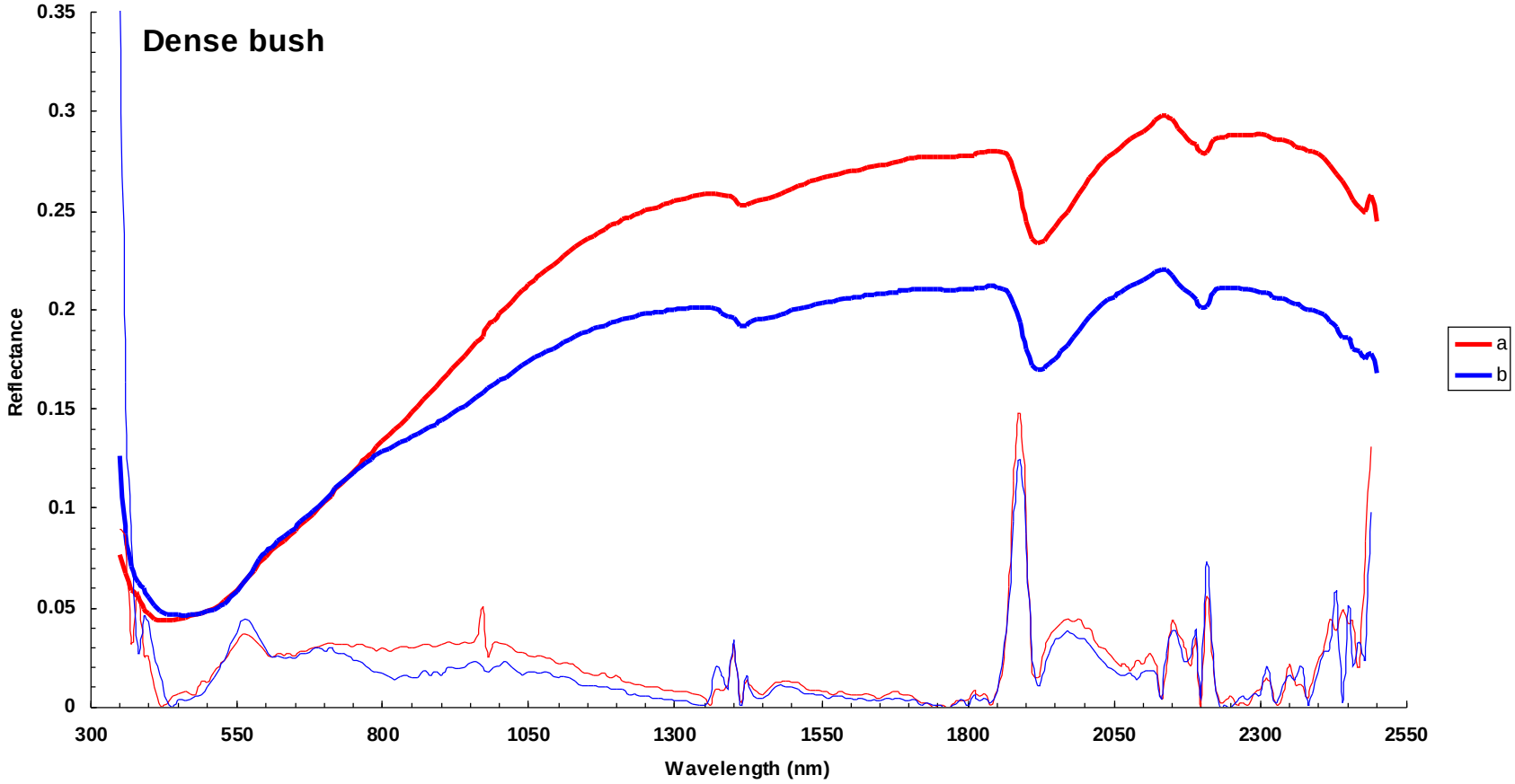

Figure 4.3.4 Spectral variation between two different soil samples taken from areas of dense bush
* Thick line plots are stacked, relative reflectance for each sample; thin line plots are the absolute value of the first derivative times 100 for each sample. Sample descriptions: (a) Southern region, soil type L2, dense acacia trees and shrubs, semi-cracking soil, lab-ID# 7913; (b) Northern region, soil type A, dense coniferous trees and shrubs, 10 m from stream, lab-ID# 8028.

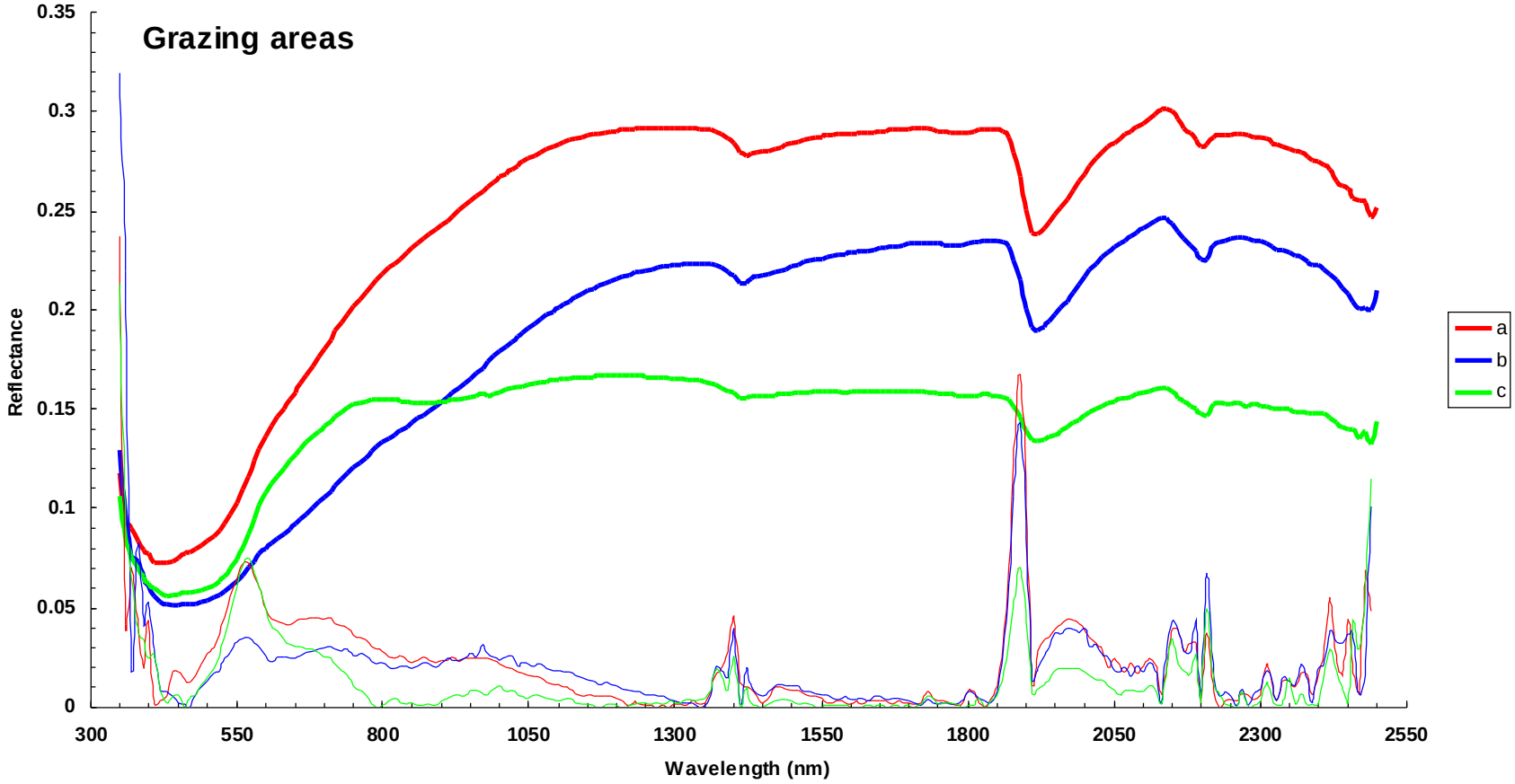

Figure 4.3.5 Spectral variation among three different soil samples taken from grazing areas
* Thick line plots are stacked, relative reflectance for each sample; thin line plots are the absolute value of the first derivative times 100 for each sample. Sample descriptions: (a) Northern region, soil type M, heavily grazed, short, sparse, yellow, lab-ID# 8044; (b) Southern region, soil type L2, signs of grazing, short, denser, yellow-green, lab-ID# 7911; (c) Central region, soil type V, signs of grazing, short, dense, yellow-green, lab-ID# 7864.

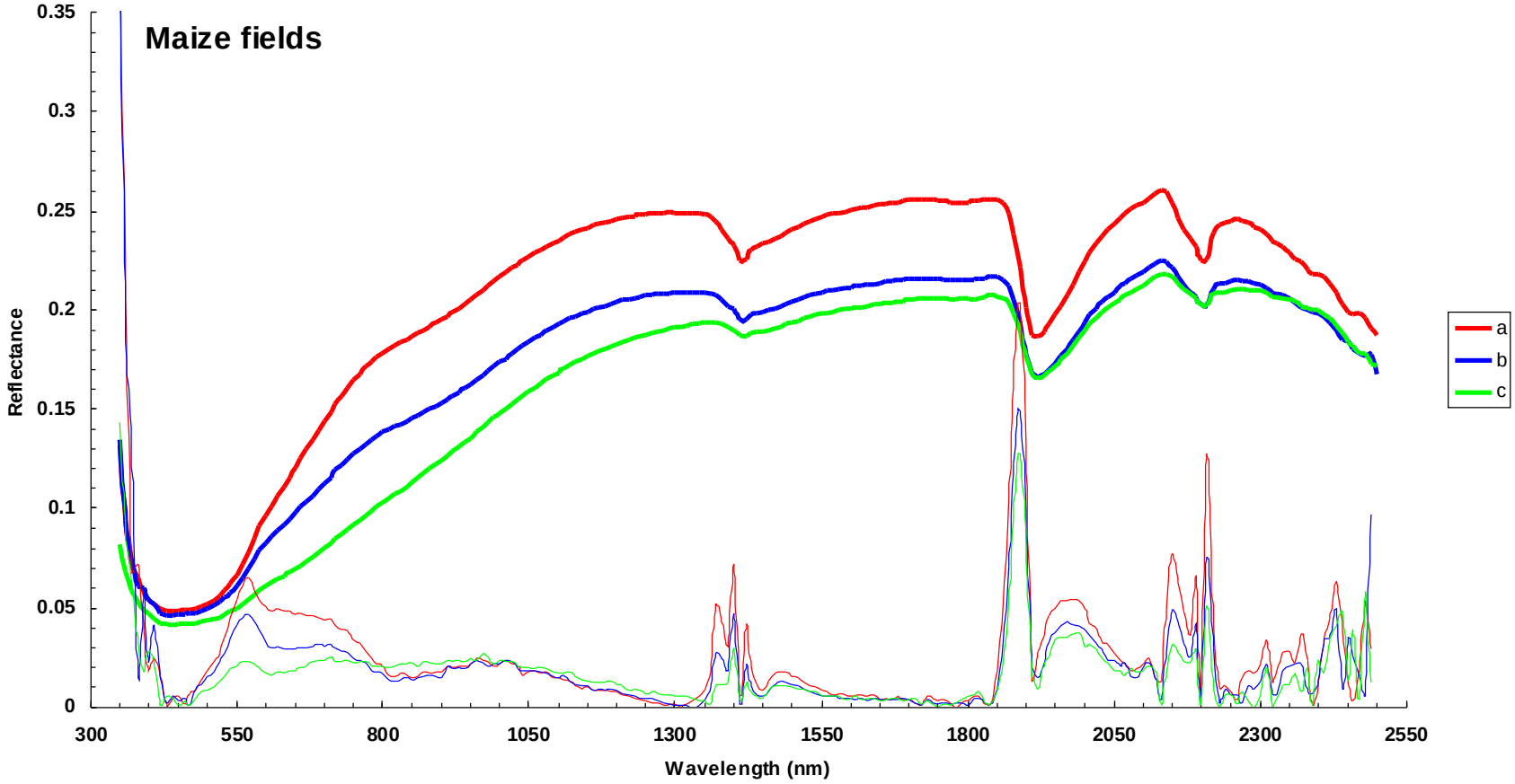

Figure 4.3.6 Spectral variation among three different soil samples taken from maize fields
* Thick line plots are stacked, relative reflectance for each sample; thin line plots are the absolute value of the first derivative times 100 for each sample. Sample descriptions: (a) Northern region, soil type V, tillage by ox plough, small plot, sparse cover, some residues present, lab-ID# 7984; (b) Northern region, soil type RU2, tillage by tractor, denser cover, some residues present, lab-ID# 7974; (c) Northern region, soil type RU3, tillage by ox plough, dense cover, residues and tall grass present, lab-ID# 7850.

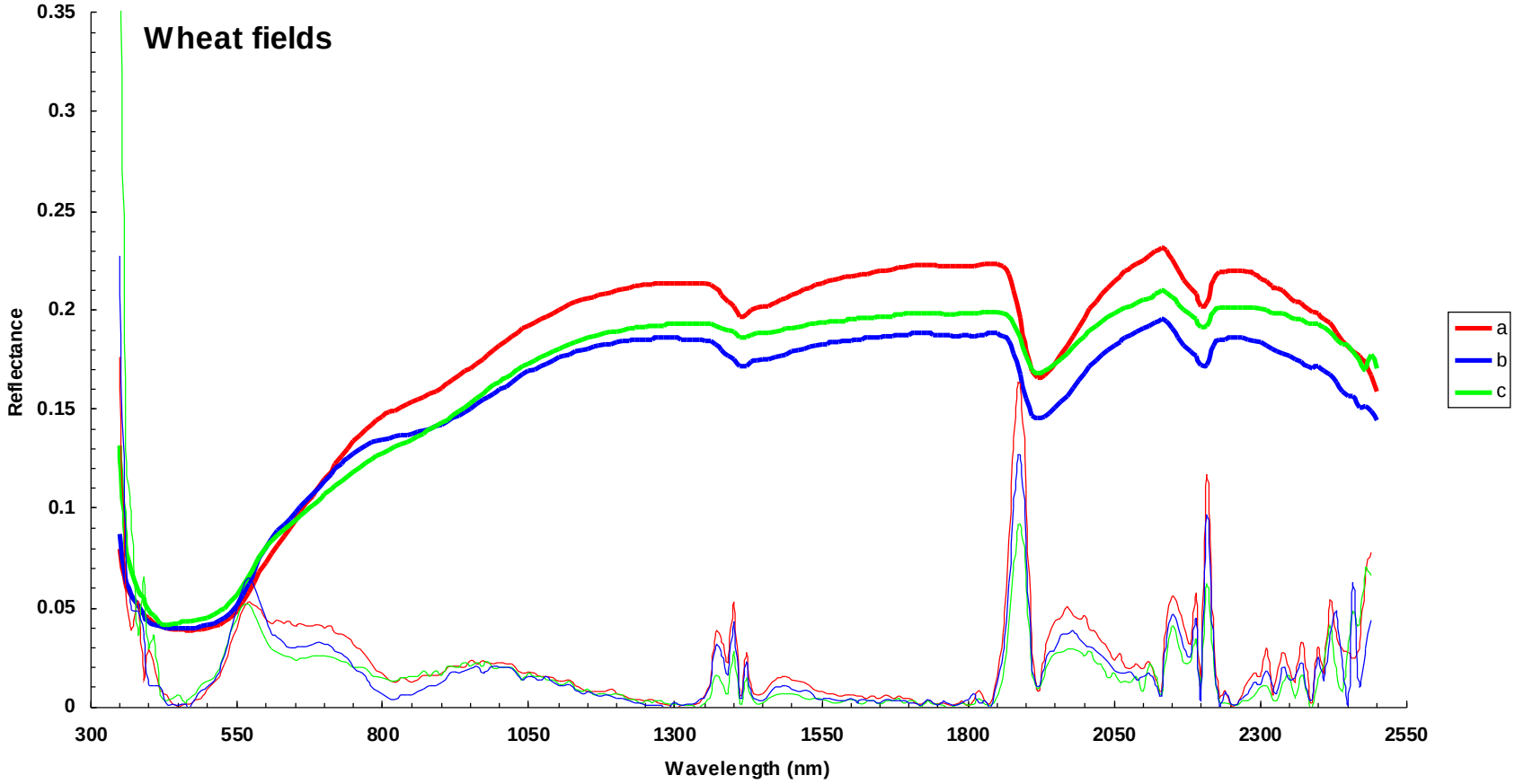

Figure 4.3.7 Spectral variation among three different soil samples taken from wheat fields
* Thick line plots are stacked, relative reflectance for each sample; thin line plots are the absolute value of the first derivative times 100 for each sample. Sample descriptions: (a) Northern region, soil type RU2, tillage by ox plough, very sparse cover, yellow, lab-ID# 7884; (b) Northern region, soil type RU2, tillage by tractor, dense cover, green, contour ridges present nearby, lab-ID# 7892; (c) Northern region, soil type RU2, tillage by ox plough, dense cover, green, contour ridges present nearby, lab-ID# 8040.