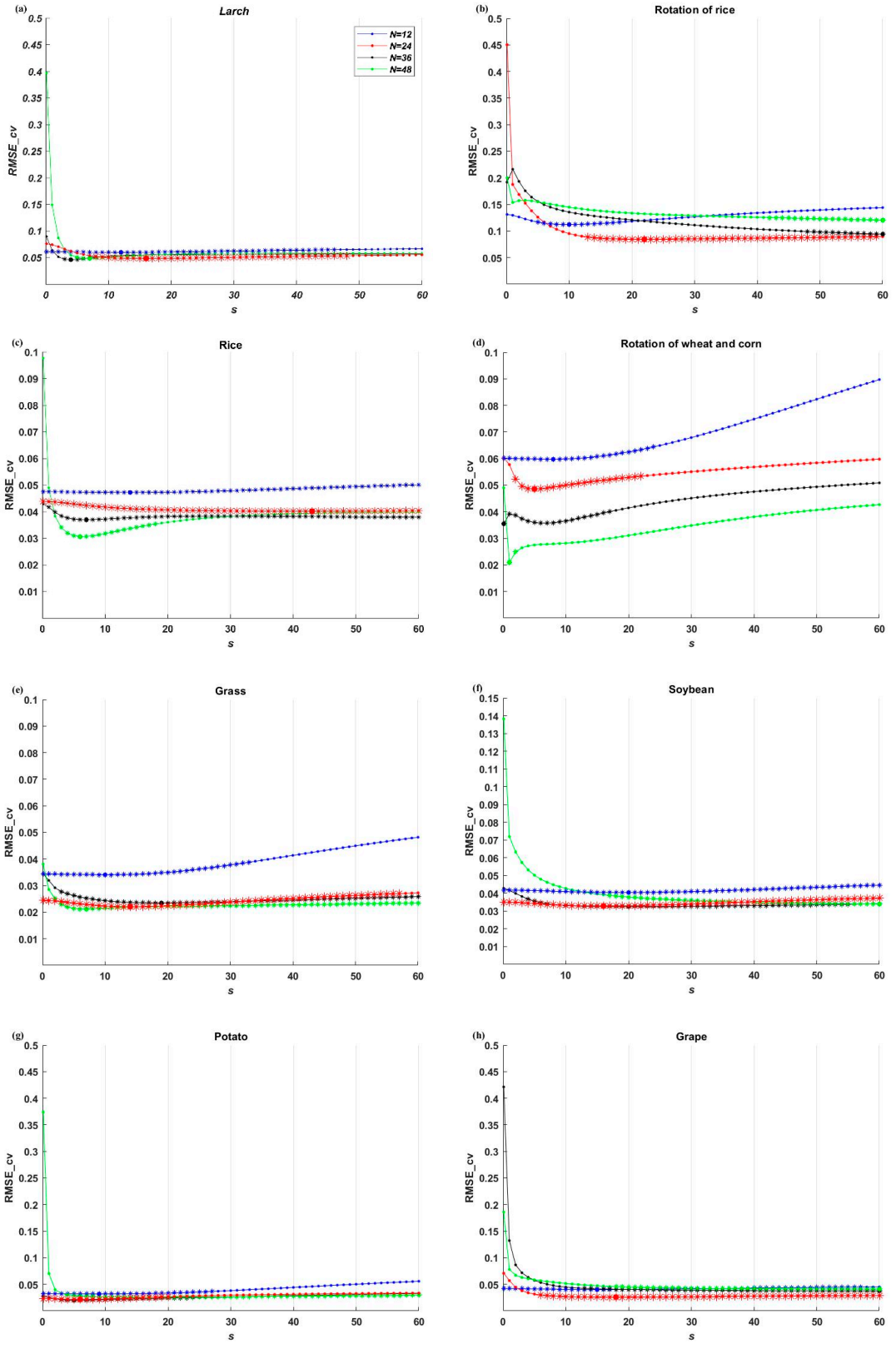

(a)
Larch
N=12
N=24
N=36
N=48
RMSE_cv
s
(b)
Rotation of rice
RMSE_cv
s
(c)
Rice
RMSE_cv
s
(d)
Rotation of wheat and corn
RMSE_cv
s
(e)
Grass
RMSE_cv
s
(f)
Soybean
RMSE_cv
s
(g)
Potato
RMSE_cv
s
(h)
Grape
RMSE_cv
s

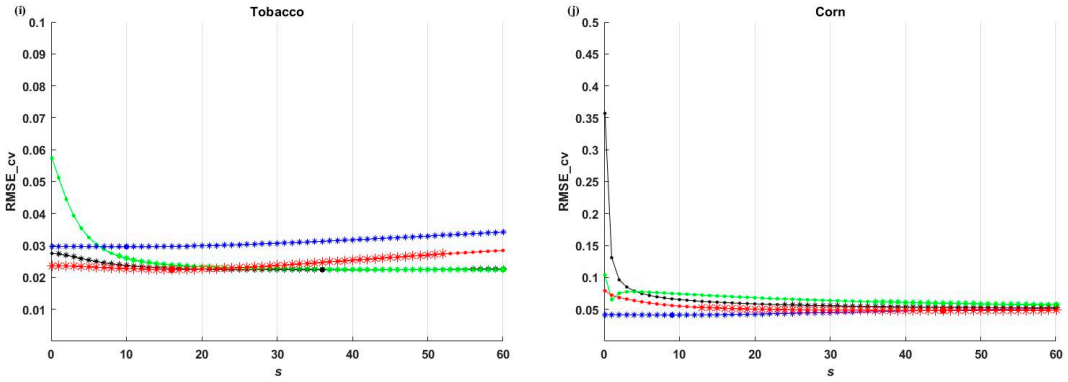


Figure S1. The calculated RMSE_cv values by the DCT-PLS method under different s and N parameters for different vegetation species samples in 2020. (a) Larch; (b) Rotation of rice; (c) Rice; (d) Rotation of wheat and corn; (e) Grass; (f) Soybean; (g) Potato; (h) Grape; (i) Tobacco; (j) Corn. (Bold points are the RMSE_cv minimum over different vegetation species samples; Asterisk points are the RMSE_cv values in the the acceptable range of s.)

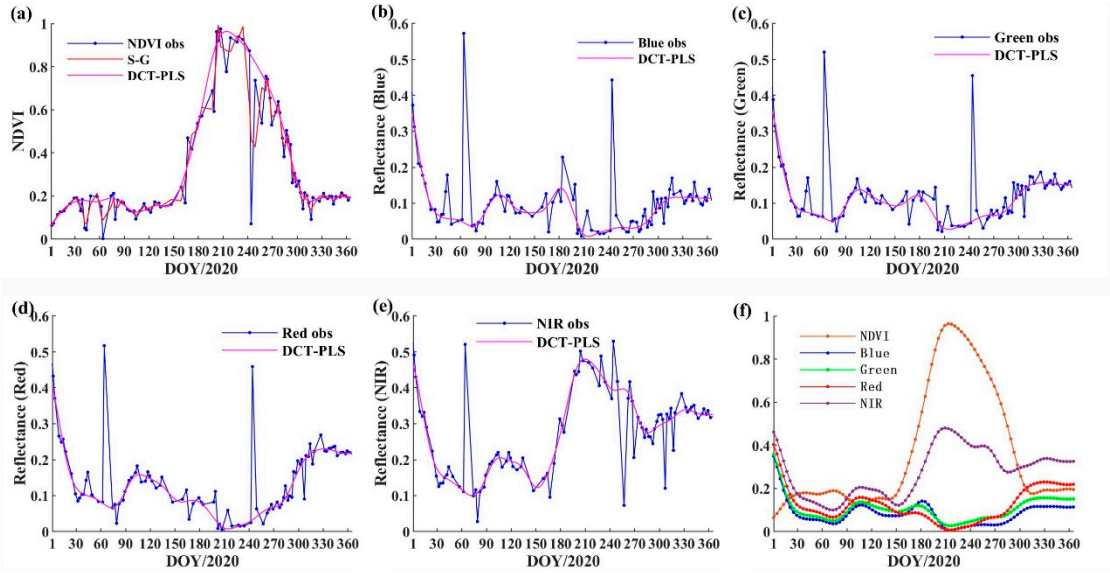


Figure S2. The comparison of NDVI and band reflectance time series from Sentinel-2, the DCT-PLS and SG filter methods for the rice sample in 2020. (a) The NDVI time series; (b-e) The surface reflectance time series in blue, green, red and NIR band respectively; (f) The reconstructed NDVI and all the band reflectance time series from the DCT-PLS method.

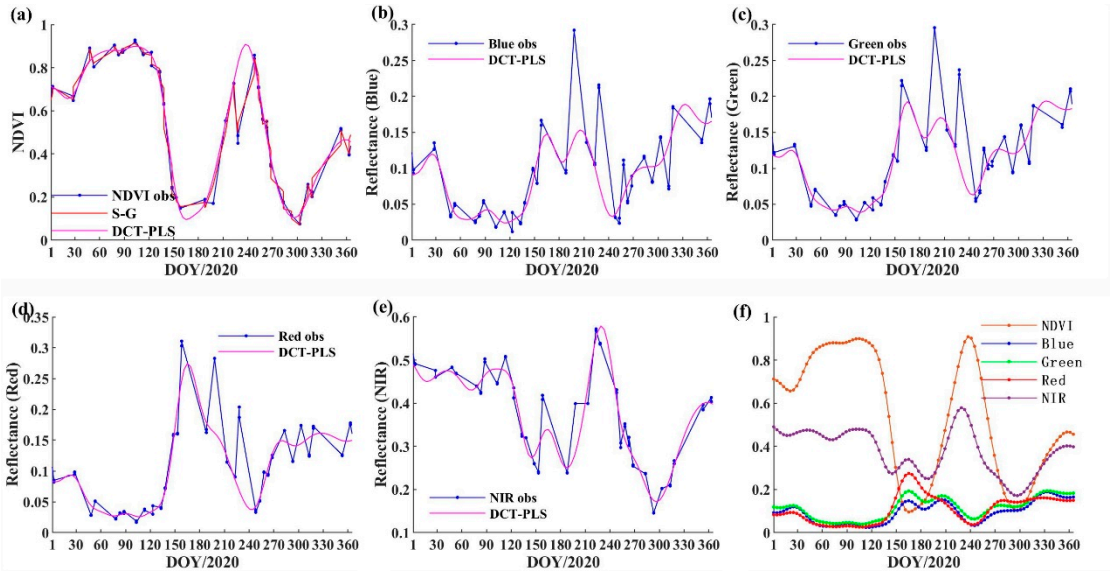


Figure S3. The comparison of NDVI and band reflectance time series from Sentinel-2, the DCT-PLS and SG filter methods for the rotation of wheat and corn sample in 2020. (a) The NDVI time series; (b-e) The surface reflectance time series in blue, green, red and NIR band respectively; (f)The reconstructed NDVI and all the band reflectance time series from the DCT-PLS method.

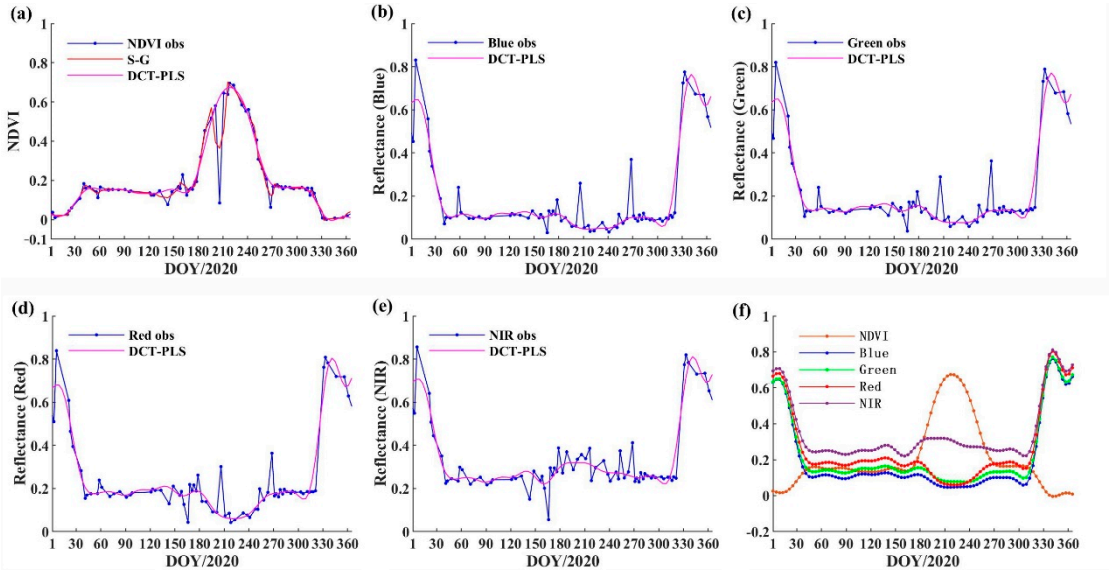


Figure S4. The comparison of NDVI and band reflectance time series from Sentinel-2, the DCT-PLS and SG filter methods for the grass sample in 2020. (a) The NDVI time series; (b-e) The surface reflectance time series in blue, green, red and NIR band respectively; (f) The reconstructed NDVI and all the band reflectance time series from the DCT-PLS method.

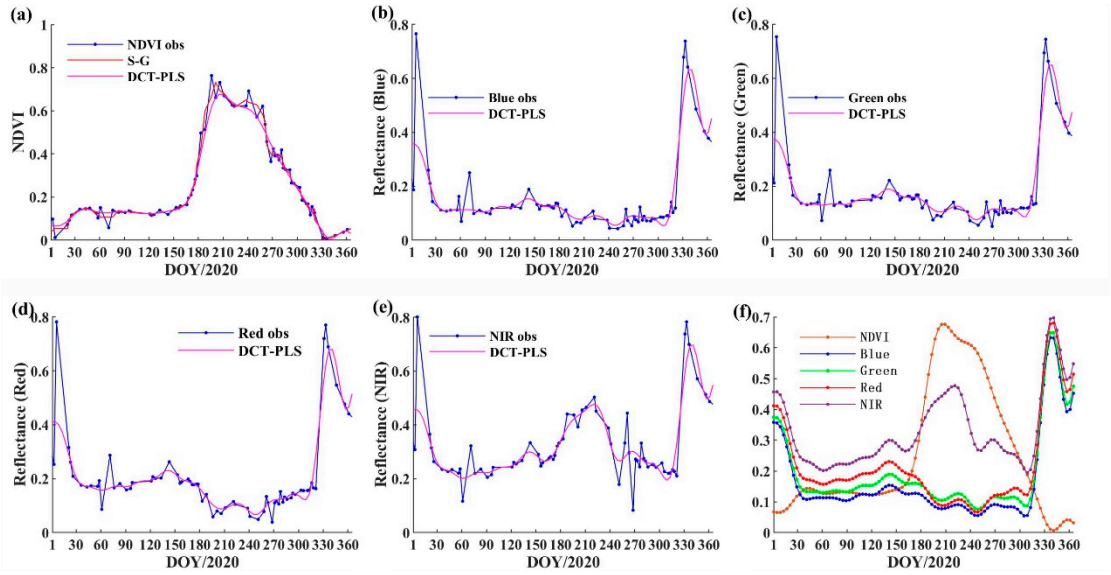


Figure S5. The comparison of NDVI and band reflectance time series from Sentinel-2, the DCT-PLS and SG filter methods for the soybean sample in 2020. (a) The NDVI time series; (b-e) The surface reflectance time series in blue, green, red and NIR band respectively; (f)The reconstructed NDVI and all the band reflectance time series from the DCT-PLS method.

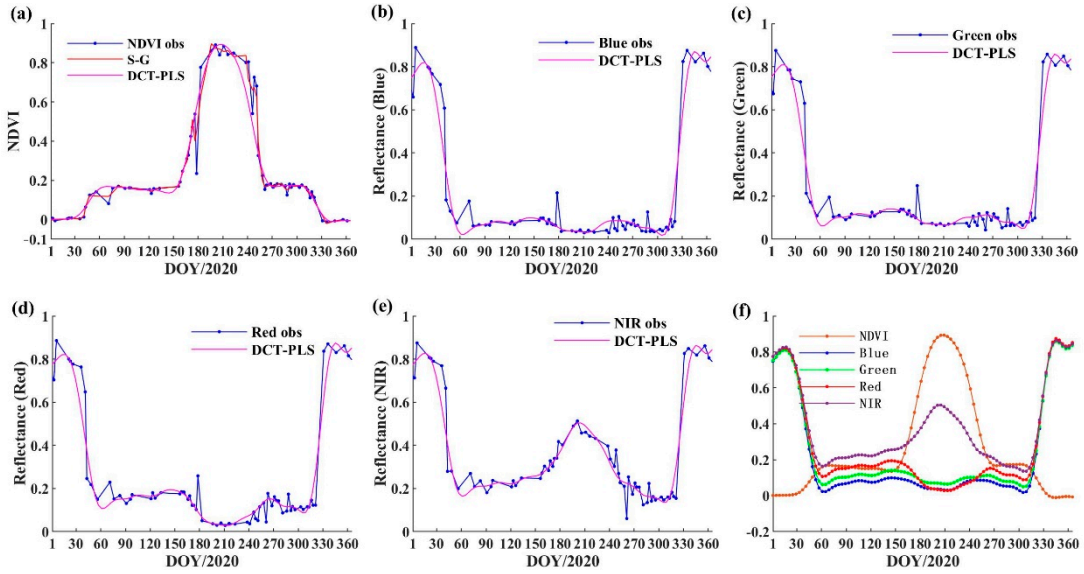


Figure S6. The comparison of NDVI and band reflectance time series from Sentinel-2, the DCT-PLS and SG filter methods for the potato sample in 2020. (a) The NDVI time series; (b-e) The surface reflectance time series in blue, green, red and NIR band respectively; (f) The reconstructed NDVI and all the band reflectance time series from the DCT-PLS method.

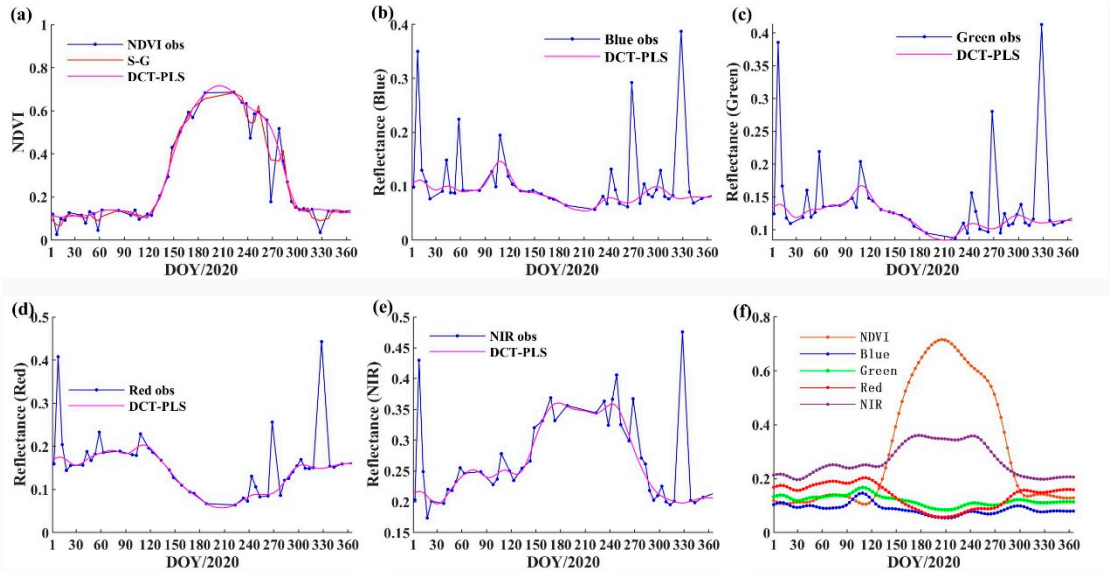


Figure S7. The comparison of NDVI and band reflectance time series from Sentinel-2, the DCT-PLS and SG filter methods for the grape sample in 2020. (a) The NDVI time series; (b-e) The surface reflectance time series in blue, green, red and NIR band respectively; (f) reconstructed NDVI and all the band reflectance time series from the DCT-PLS method.

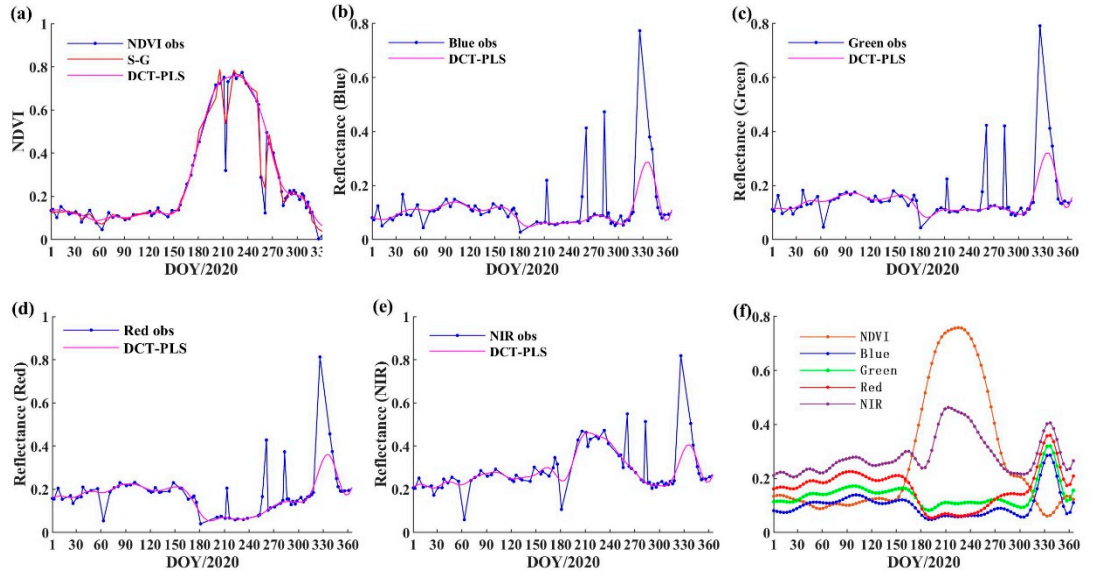


Figure S8. The comparison of NDVI and band reflectance time series from Sentinel-2, the DCT-PLS and SG filter methods for the tobacco sample in 2020. (a) The NDVI time series; (b-e) The surface reflectance time series in blue, green, red and NIR band respectively; (f) reconstructed NDVI and all the band reflectance time series from the DCT-PLS method.