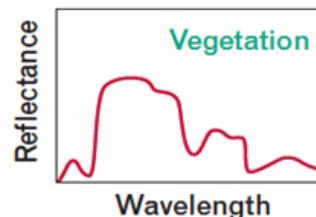
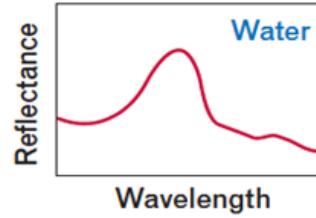
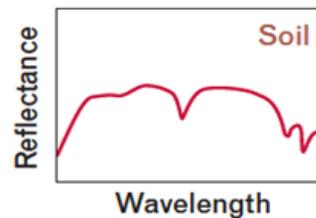
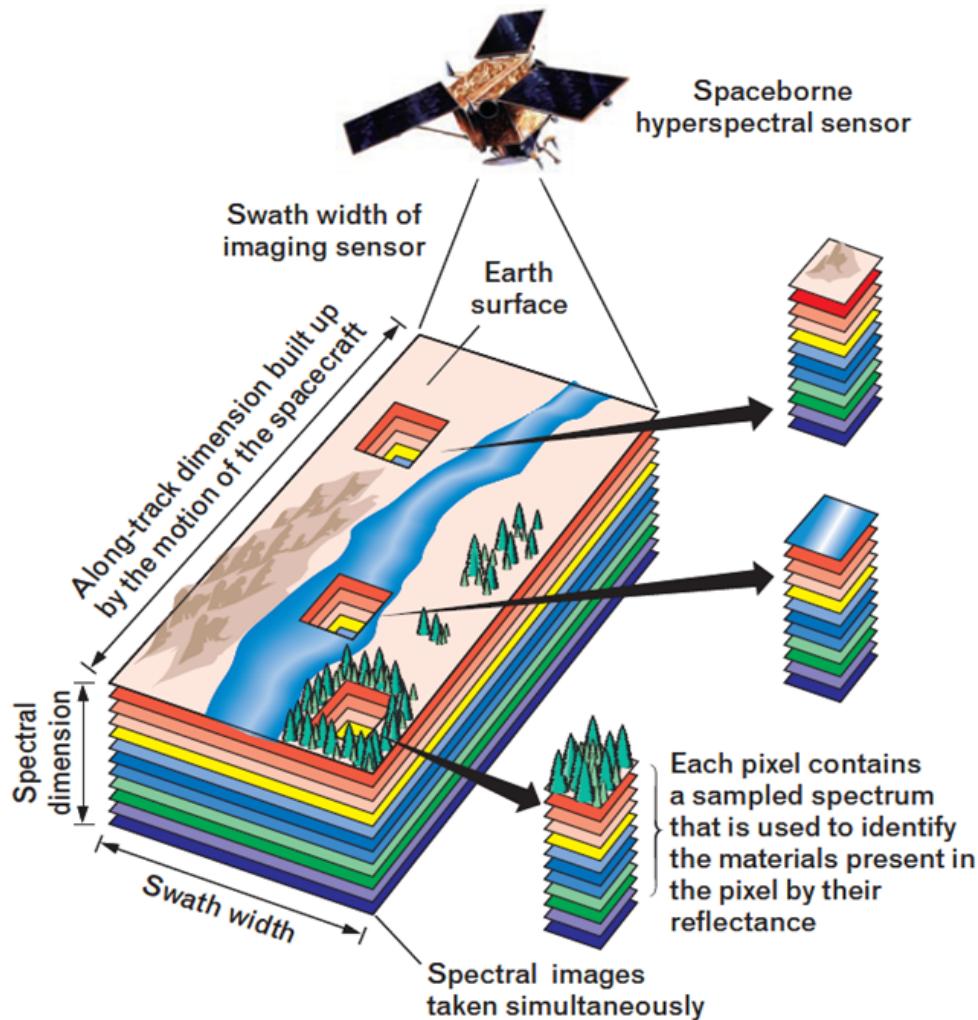
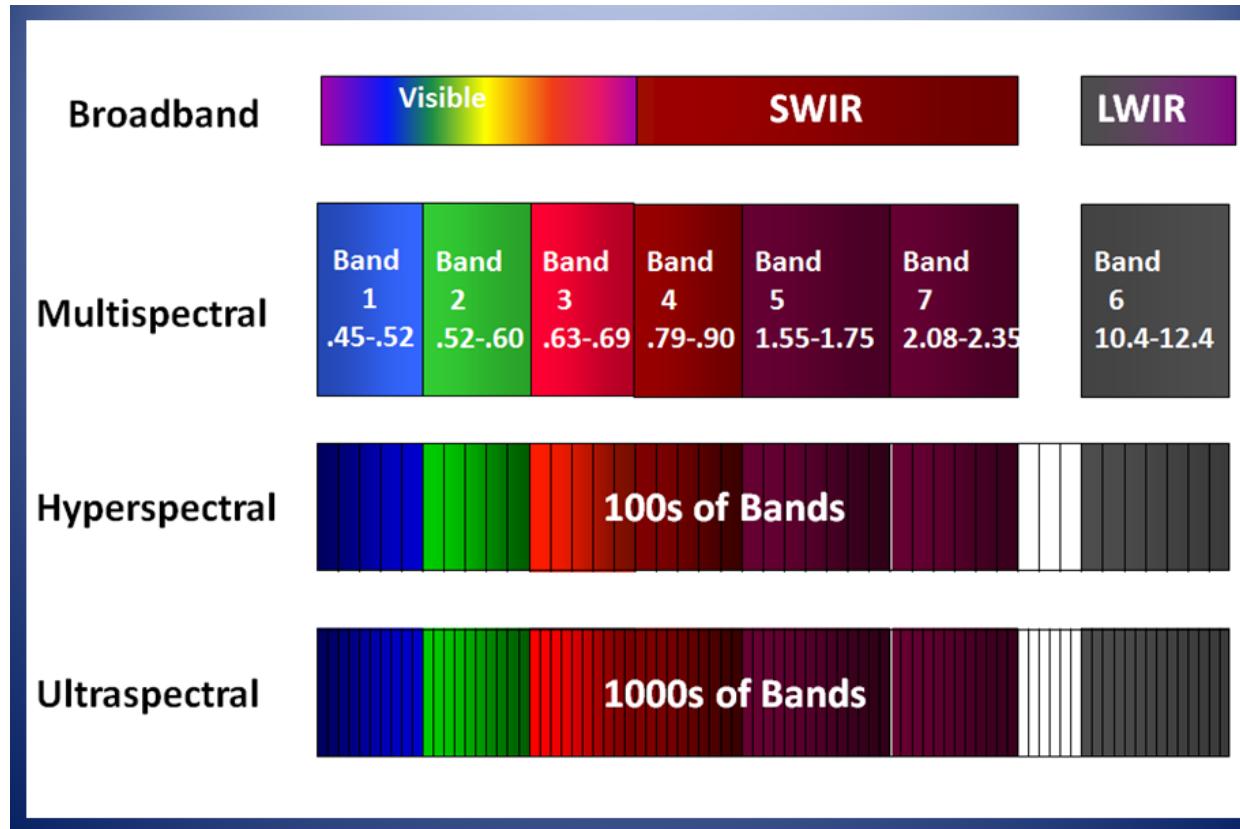


Hyperspectral imaging

- The main objective of imaging spectroscopy is to measure the spectral signatures and/or chemical composition of all features within the sensor's field of view.
-
- Each pixel across a sequence of continuous, narrow spectral bands, contains both spatial and spectral properties.
-
- Pixels are sampled across many narrowband images at a particular spatial location within the "spectral cube", resulting in a one-dimensional spectrum.
-
- The spectrum can be used to identify and characterize a particular feature within the scene, based on unique spectral signatures or "fingerprints".





Data

Image data

Measured at 5 different vegetative stages in the crop cycle.

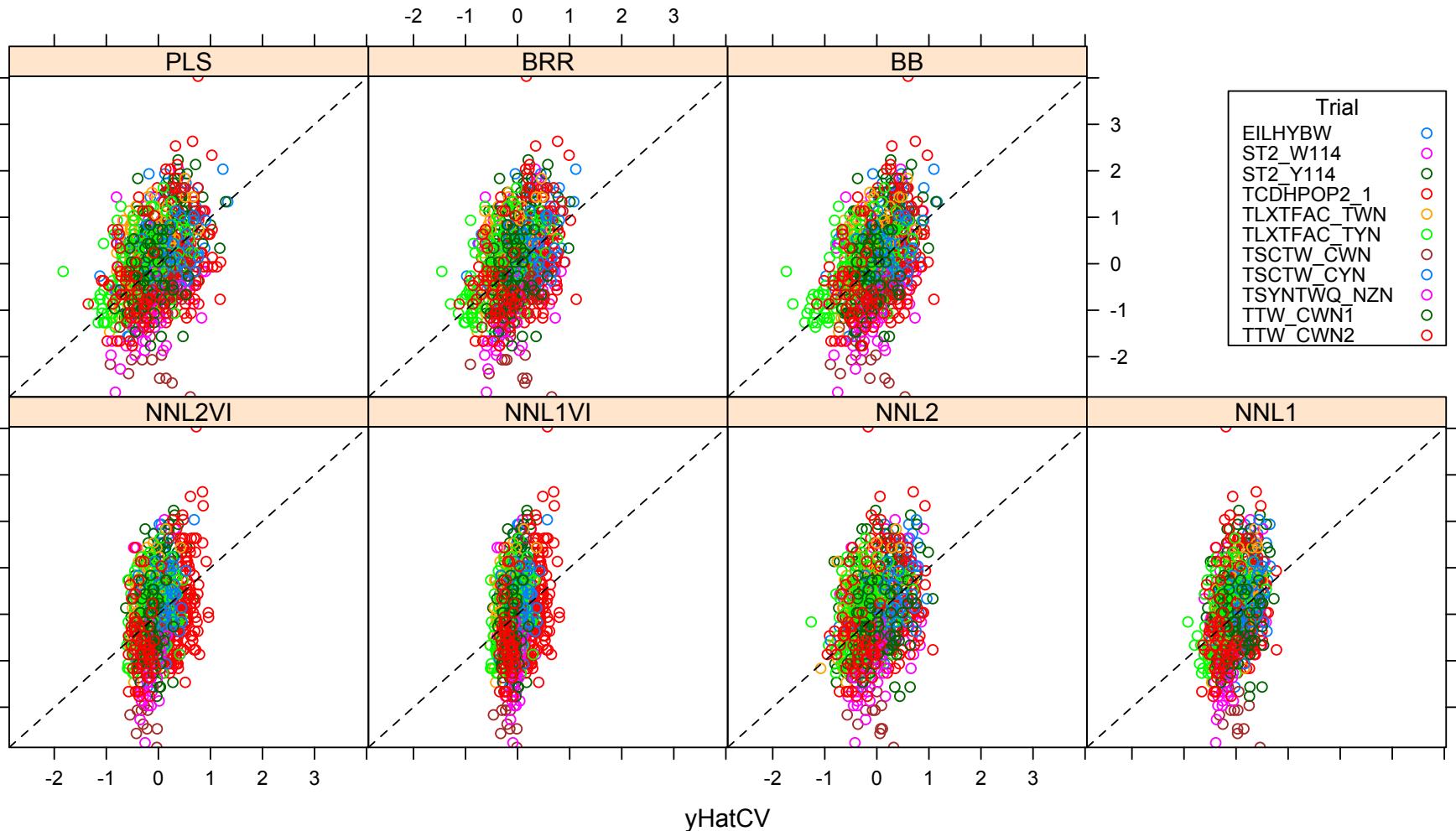
Measured using a multispectral camera, 62 wavelength bands between 400 to 850 nm.

Phenotypic data

465 maize hybrids tested in 12 trials (11 under heat-drought stress and 1 under well-watered condition).

Trials were laid in a alpha lattice design with 2 or 3 replicates
Grain yield measured in ton/ha.

Observed vs predicted values by each model



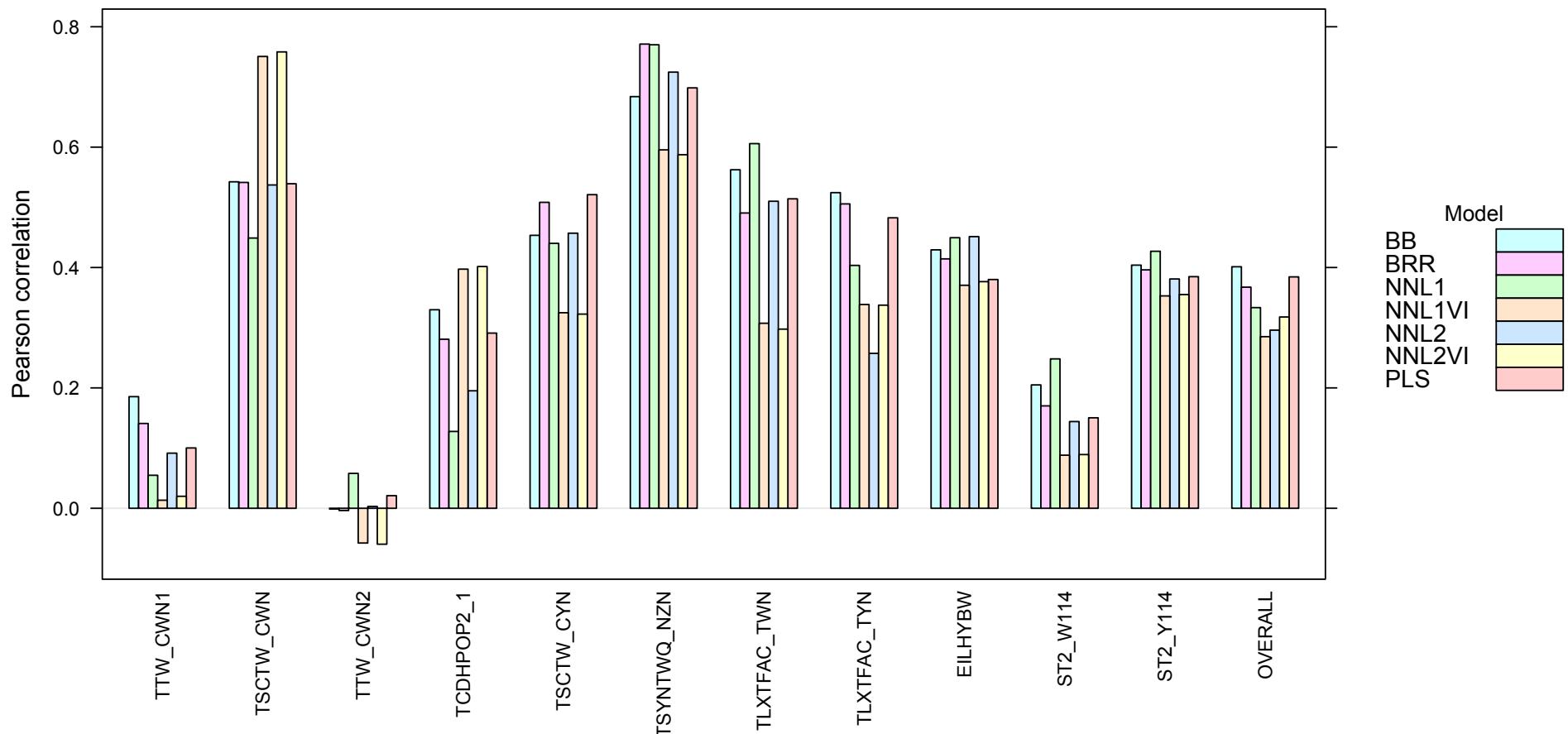
NNL1: Lambda1=0.001, (50,40) nodes

NNL2: Lambda1=0.01, (50,40) nodes

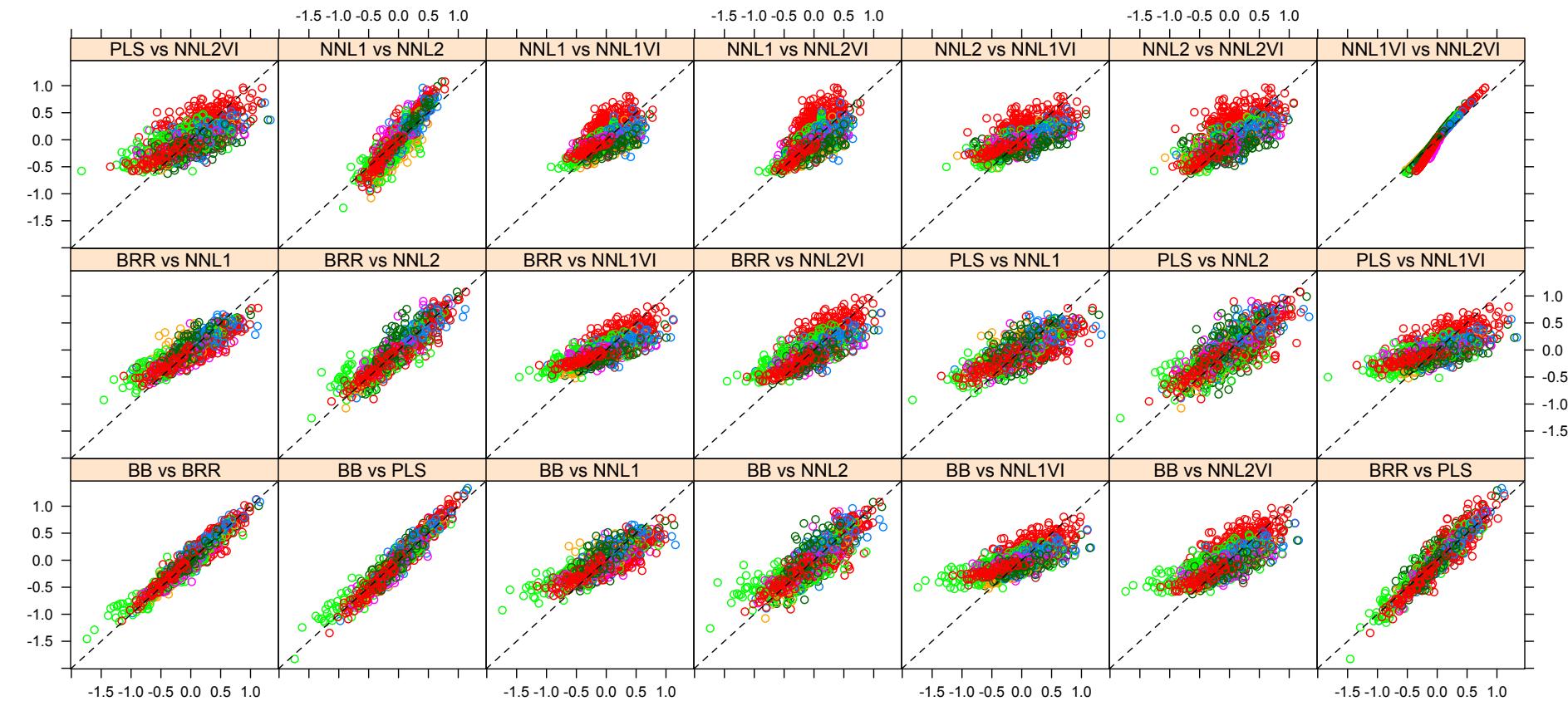
Correlation between observed and predicted values for each trial and model

Trial	N	BB	BRR	PLS	NNL1	NNL2	NNL1VI	NNL2VI
TTW_CWN1	66	0.1854	0.1409	0.1002	0.0548	0.0916	0.0134	0.0199
TSCTW_CWN	30	0.5424	0.5413	0.5392	0.4490	0.5371	0.7506	0.7582
TTW_CWN2	56	-0.0012	-0.0037	0.0209	0.0579	0.0030	-0.0577	-0.0597
TCDHPOP2_1	221	0.3298	0.2808	0.2910	0.1276	0.1952	0.3973	0.4016
TSCTW_CYN	39	0.4535	0.5083	0.5210	0.4401	0.4570	0.3249	0.3226
TSYNTWQ_NZN	30	0.6839	0.7712	0.6985	0.7701	0.7246	0.5954	0.5874
TLXTFAC_TWN	76	0.5624	0.4906	0.5141	0.6058	0.5101	0.3074	0.2976
TLXTFAC_TYN	148	0.5244	0.5057	0.4826	0.4035	0.2573	0.3386	0.3374
EILHYBW	84	0.4294	0.4144	0.3801	0.4495	0.4513	0.3705	0.3765
ST2_W114	112	0.2050	0.1701	0.1503	0.2482	0.1441	0.0882	0.0892
ST2_Y114	144	0.4039	0.3961	0.3848	0.4270	0.3810	0.3528	0.3551
OVERALL	1006	0.4013	0.3673	0.3844	0.3334	0.2959	0.2851	0.3178

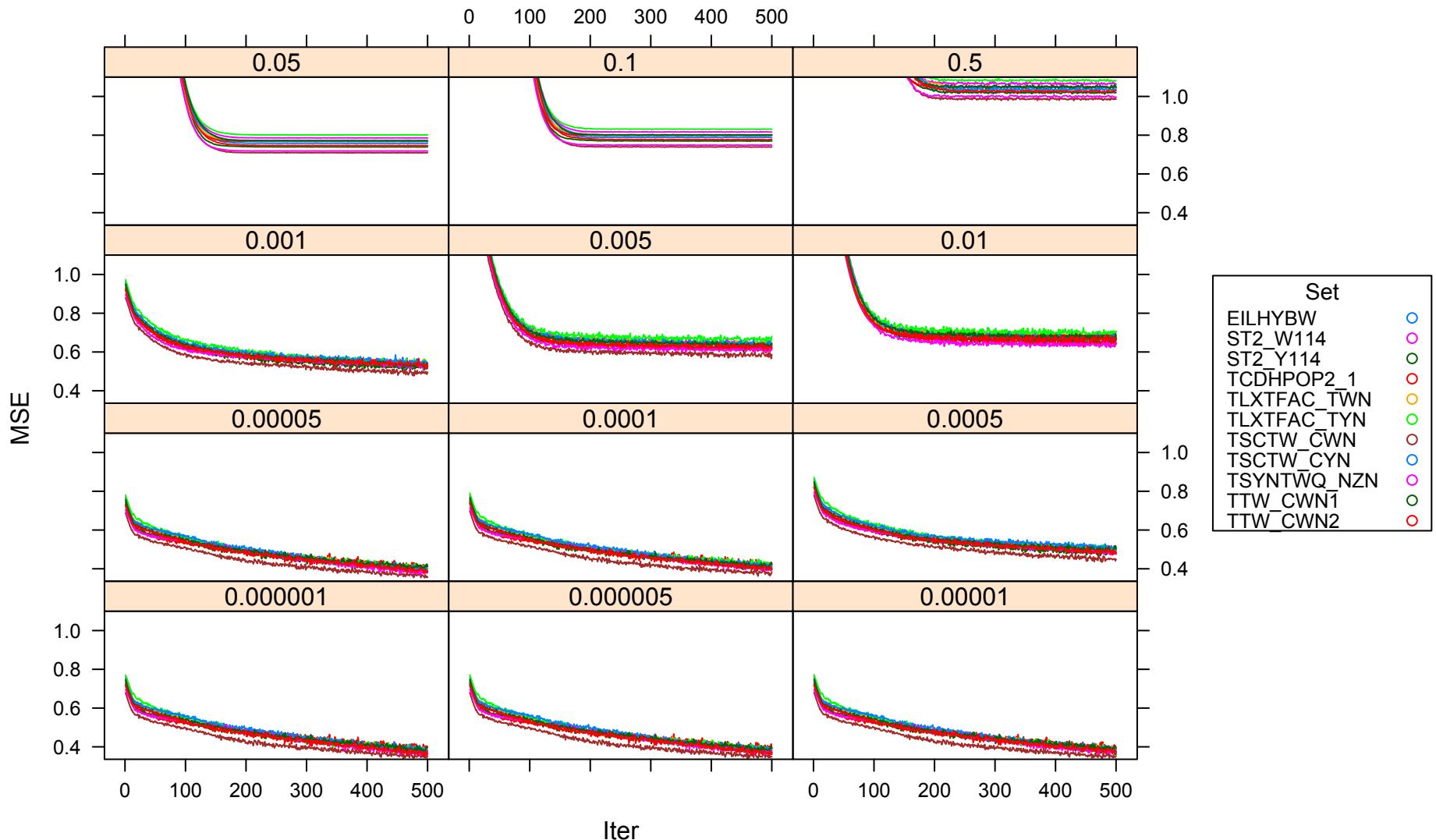
Correlation Observed vs Predicted



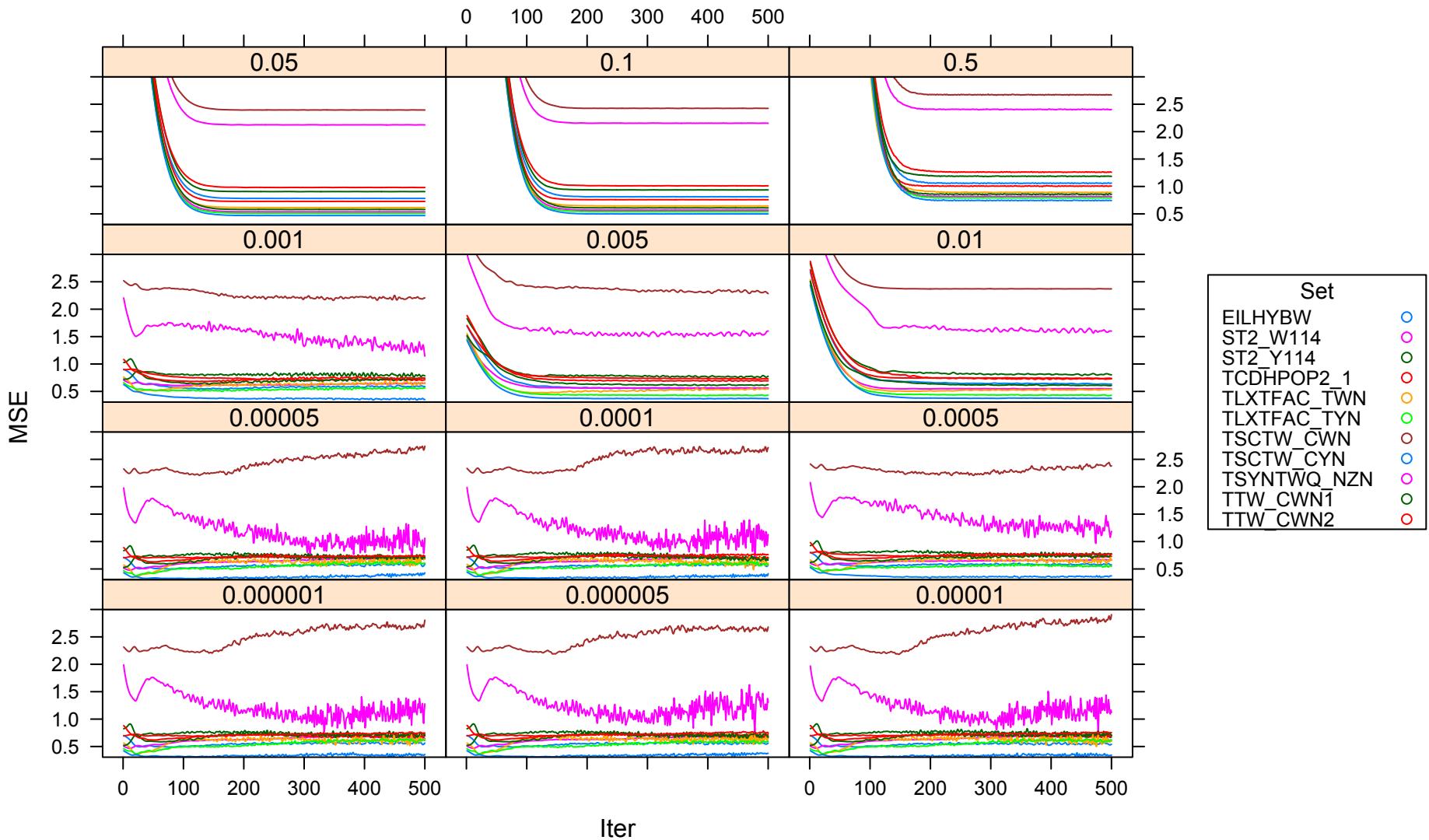
Predicted values. Comparison of models



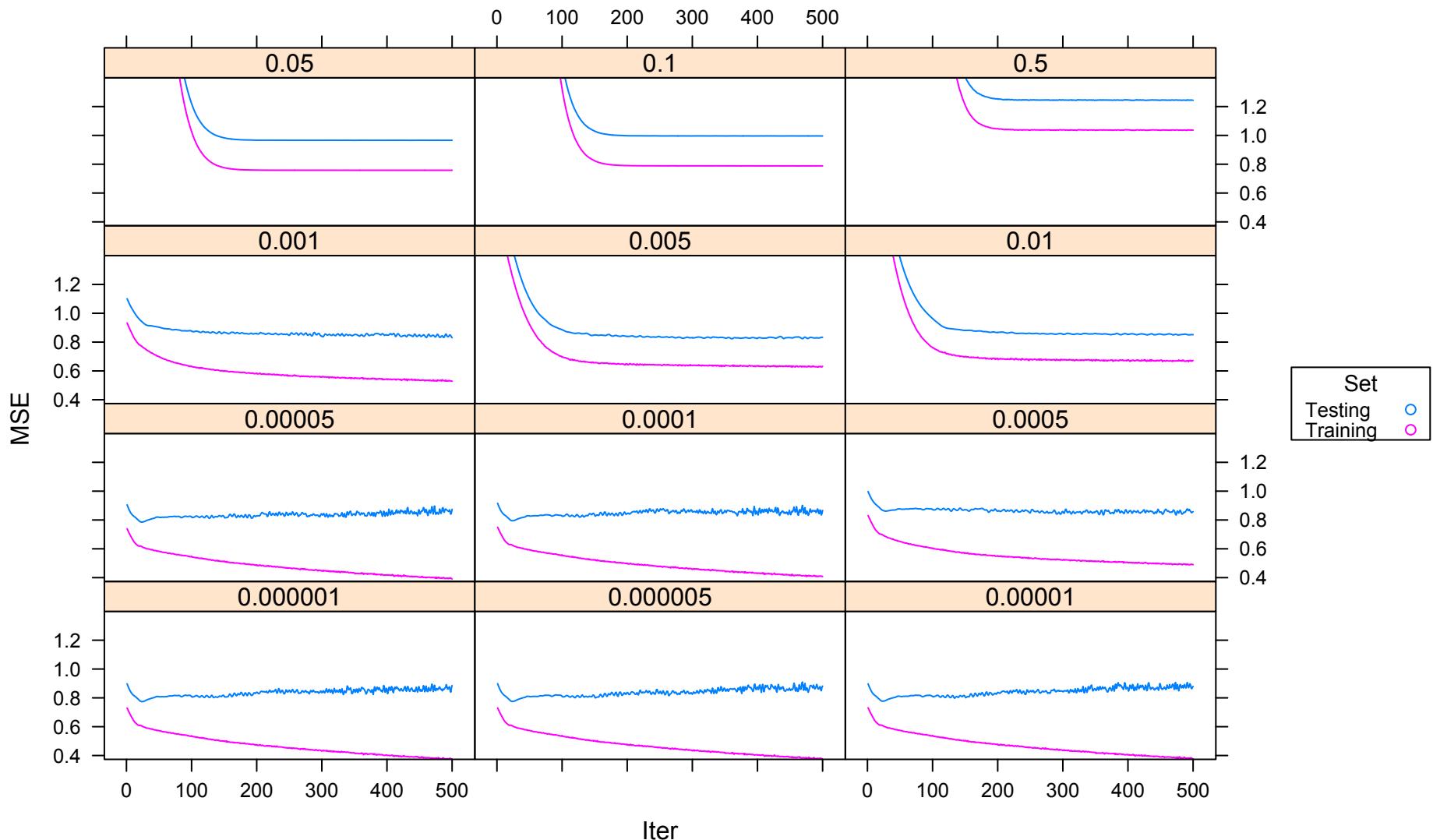
TRAINING MSE value per epoch. Model NNL1



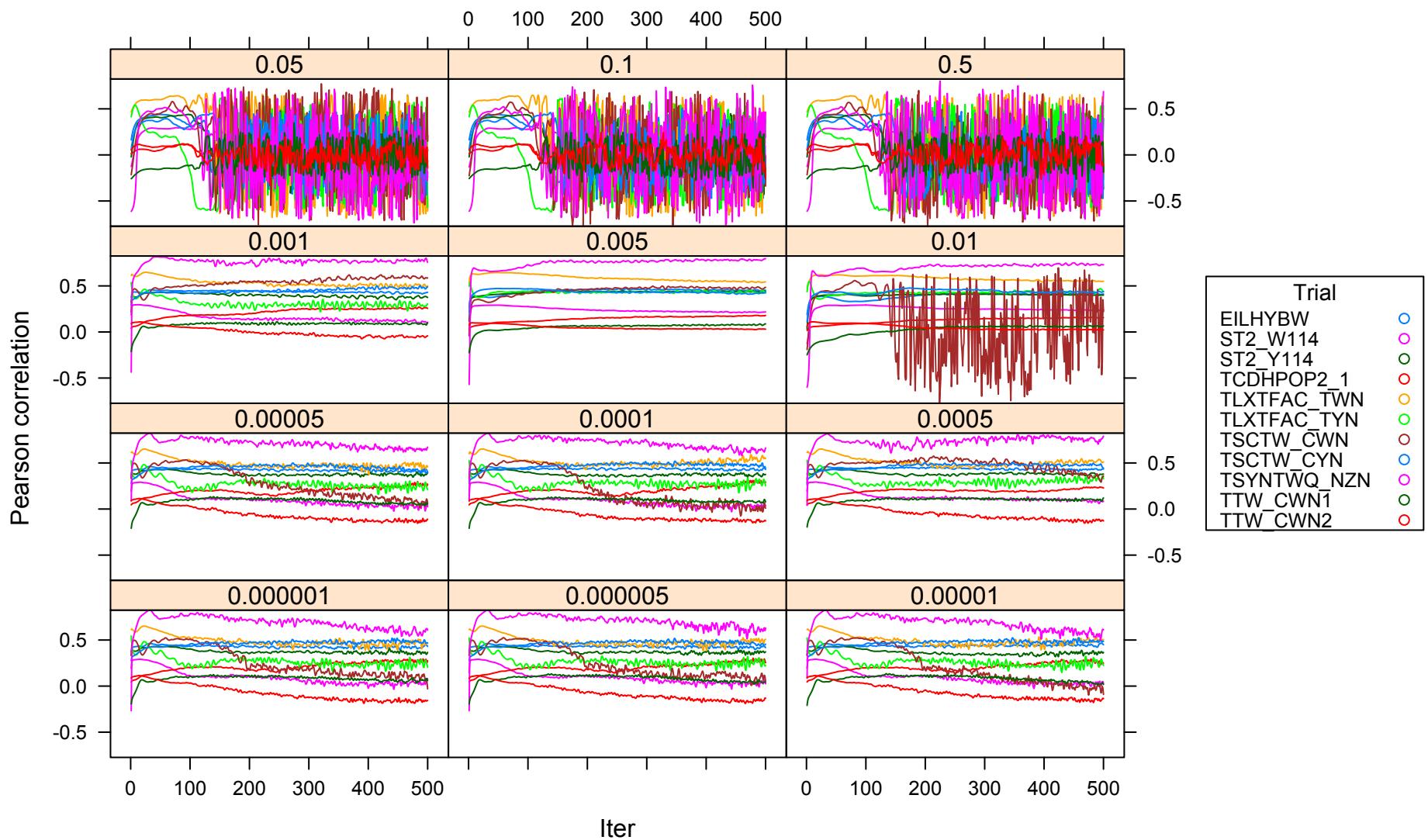
TESTING MSE value per epoch. Model NNL1



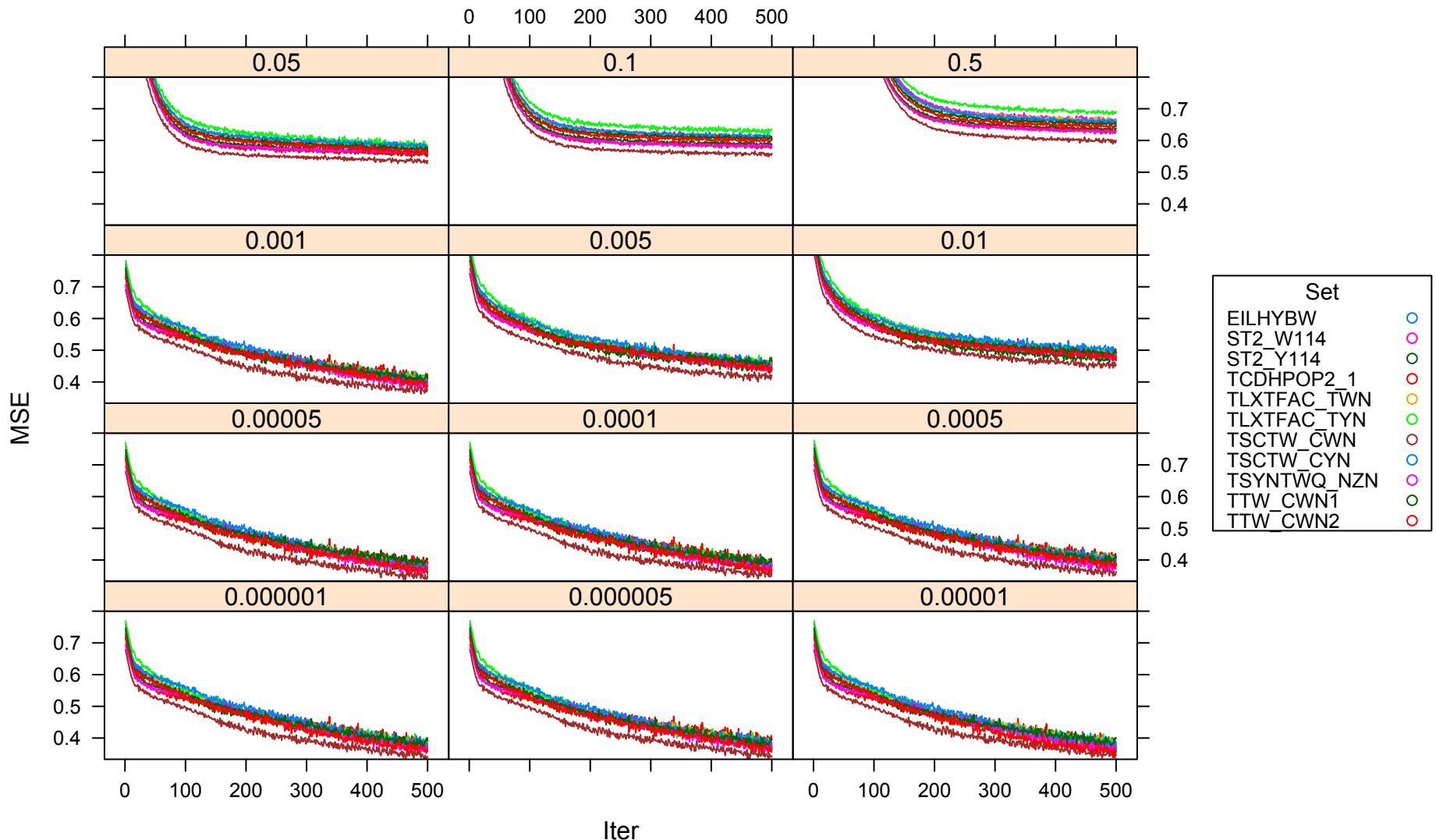
Loss function value per epoch. Model NNL1



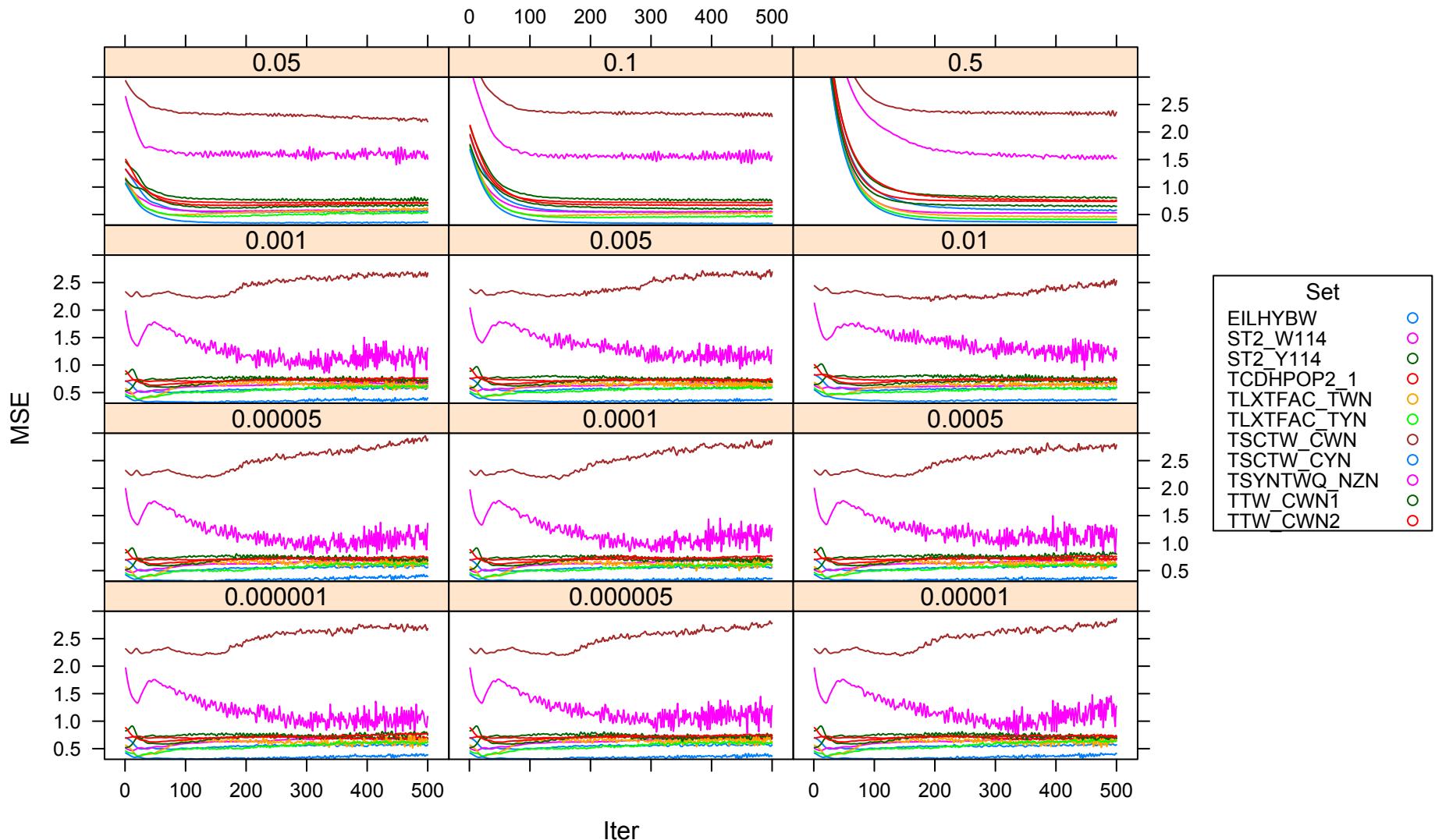
Validation accuracy for different L1 values. Model NNL1



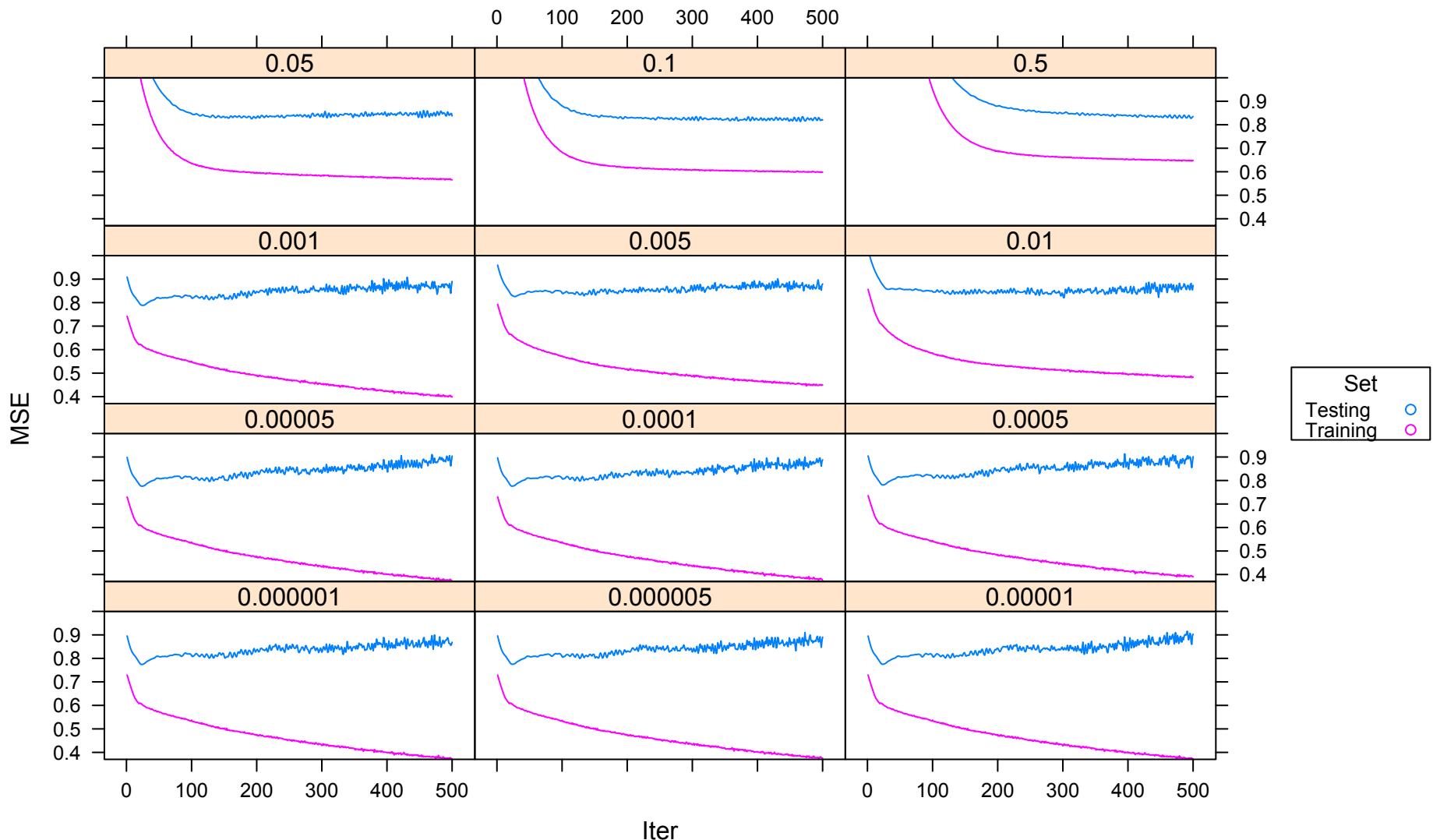
TRAINING MSE value per epoch. Model NNL2



TESTING MSE value per epoch. Model NNL2



Loss function value per epoch. Model NNL2



Validation accuracy for different L2 values. Model NNL2

