

AGRY 515: Plant Mineral Nutrition
Distance Transport
PowerPoint File: LongDistTrans_Slides_2012.ppt

Occurs in Vascular System: Xylem and Phloem (Fig. 1, 2)

Xylem Transport: Unidirectional

Driving Forces:

Water potential gradient

Root pressure

Features (Fig. 3, 4, 5):

Unloading along transport pathway -

Exchange Adsorption

Resorption

Secretion

Unloading in leaves (Fig. 6)

Role of Transpiration Rate

Phloem Transport: Bi-directional

Driving Force:

Pressure flow hypothesis (Fig. 7)

Features (Fig. 8, 9, 10):

Anatomy: Sieve tubes / plates

Composition (Table 1)

Mobility (Fig. 11, Table 2)

Relative Importance of Phloem / Xylem Transport

Highly Mobile: Developmental Stage

Low Mobility:

Root pressure

Cell to cell movement

Retranslocation (Fig. 9, 10):

Importance of Cycling

Net Remobilization

Seed germination

Vegetative Stage

Reproductive Stage

Leaf Senescence - Perennials only