

**MECHANISMS BEHIND THE SUCCESS OF AN INVASIVE TREE IN TALLGRASS PRAIRIE:
POTENTIAL ALLOPATHIC EFFECTS OF EASTERN RED CEDAR (*JUNIPERUS VIRGINIANA*)**

MARY ANN VINTON*, DEPARTMENT OF BIOLOGY, CREIGHTON UNIVERSITY, OMAHA,
NE 68178

JANE MATHEW, DEPARTMENT OF BIOLOGY, CREIGHTON UNIVERSITY, OMAHA, NE
68178

Abstract: Eastern red cedar (*Juniperus virginiana*) is a native tree in North American prairies, but is invasive in poorly managed or extensively grazed grasslands. Mature Eastern red cedar stands are characterized by a lack of plant growth under the canopy, an effect that could be due to light suppression. An alternative explanation is that Eastern red cedar soils retard growth of other plants, possibly due to allelopathic compounds. We used a bioassay method to test the capability of cedar- vs. grassland-derived soil to support plant growth. Surface soil was collected at T.L. Davis Prairie (10 km E of Omaha, NE) from two adjacent locations: directly under mature Eastern red cedar stands and directly under neighboring tallgrass stands. Seeds of a variety of native and commercial target species were planted in the two soil types and grown in a greenhouse under well-watered, full light conditions. Target plant area and biomass were greater in for some species in grassland-derived vs. cedar-derived soil. However, for other species, no effect of soil origin was detected. Soil analyses indicated that eastern red cedar-derived soils were not necessarily inferior in pH and nutrients compared to grassland-derived soils. More work is needed to pin down the mechanism of Eastern red cedar dominance over other plants. However, our bioassay results suggest that alleopathy or soil quality changes could play an important role.