

**Introduction to Goat Nutrition**  
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**Maps Showing General Regional Soil Deficiencies of Cobalt, Molybdenum, Copper, and Selenium in the United States**



*Geographical distribution of cobalt-deficient areas in the eastern U.S.*

Soil-Related Nutritional Problem Areas for Grazing Animals

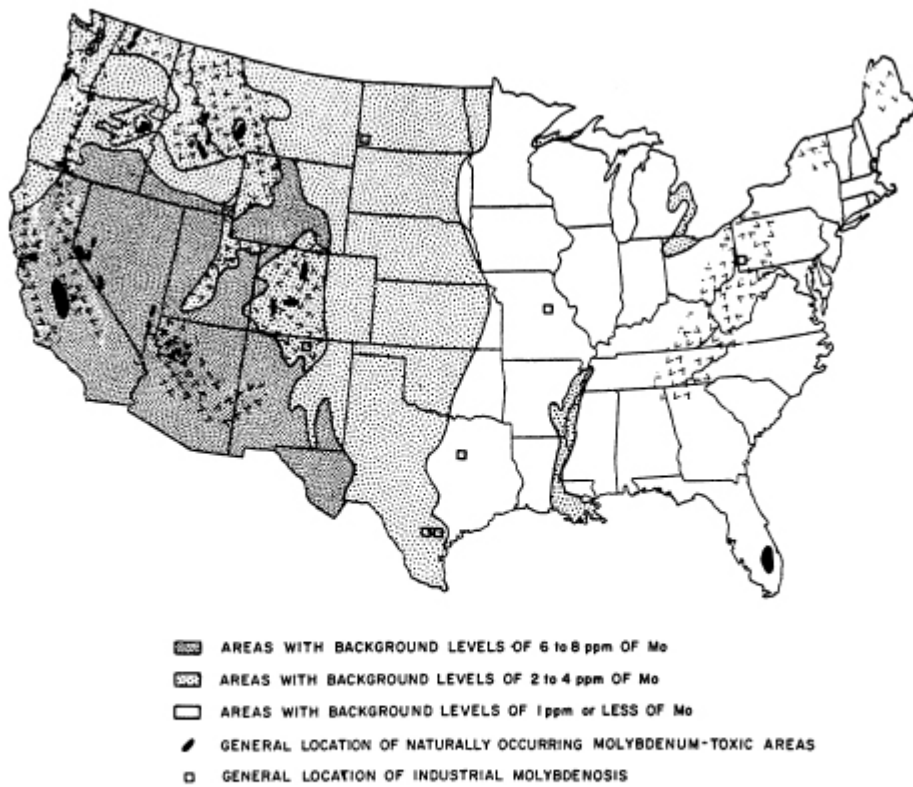
**Figure 1.** Geographical distribution of Co-deficient areas in the eastern United States (ppm =  $1 \mu\text{g/ g}^{-1}$ ). From Kubota and Allaway, 1972, by permission Soil Science Society of America.



**COBALT**

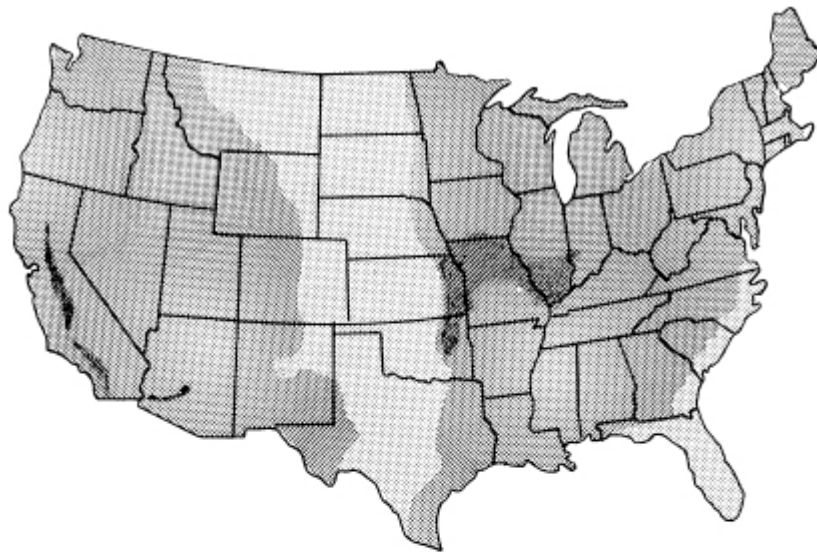
-  Areas where legumes usually contain less than 0.07 ppm of cobalt.
  -  Areas where legumes usually contain from 0.05 to 0.1 ppm of cobalt.
- Grasses generally contain less than 0.10 ppm of cobalt throughout most of the U.S.




*Generalized regional pattern of molybdenum concentration in legumes of the U.S.*



**Figure 6.** Generalized regional pattern of molybdenum concentration in legumes of the United States (ppm =  $1 \mu\text{g}/\text{g}^{-1}$ ). From Kubota, 1977, by courtesy Marcel Dekker, Inc.

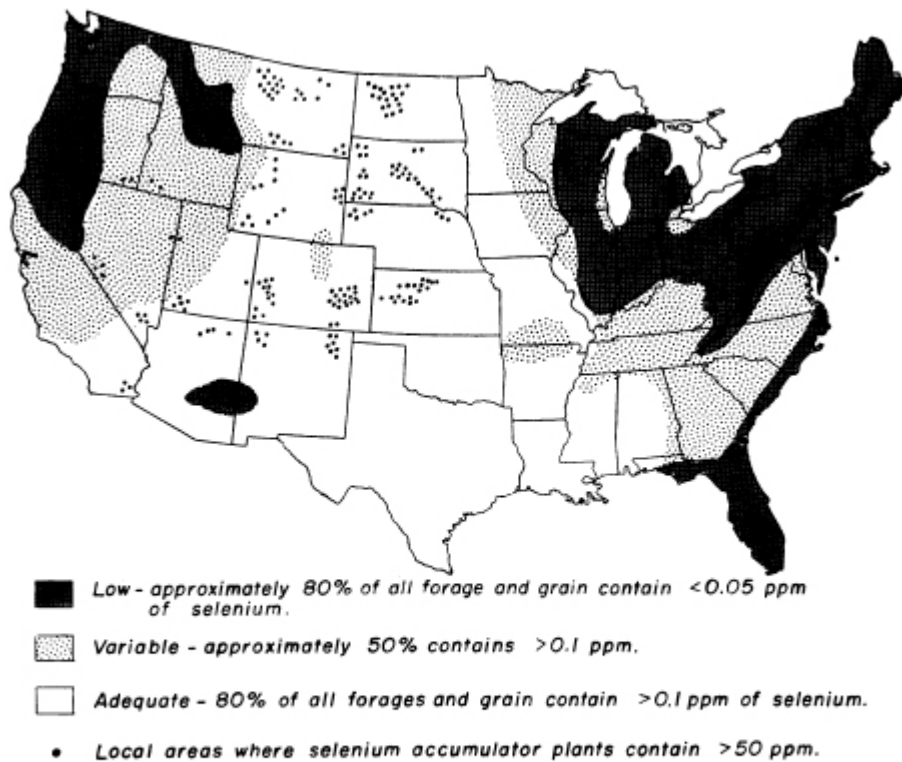
*General distribution of copper concentrations in legumes in the U.S.*



-  AREAS WHERE 50% OR MORE OF LEGUMES HAVE 10-12+ PPM OF COPPER
-  AREAS WHERE 40-70% OF LEGUMES HAVE 6-10 PPM OF COPPER
-  AREAS WHERE 35% OR MORE OF LEGUMES HAVE 6 PPM OR LESS OF COPPER

**Figure 7.** Generalized distribution of copper concentration in legumes of the United States (ppm =  $1 \mu\text{g}/\text{g}^{-1}$ ). From Kubota, 1983a, by permission Amer. Society of Agronomy.

*Geographical distribution of low-, variable-, and adequate-selenium areas in the U.S.*



**Figure 8.** Geographical distribution of low-, variable-, and adequate-Se areas in the United States (ppm = 1 µg/g). From Kubota and Allaway, 1972, by permission Soil Science Society of America.

*All soil maps from Kubota, Welch, and Van Campen. 1987. Adv. Soil Sci. 6:189-215.*

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