Reprinted with permission from: Leafy Spurge Symposium Proceedings. Bozeman, MT. June 21-22, 1982. p. 9.

Published by: Great Plains Agricultural Council.

Utilization of leafy spurge as a source of hydrocarbons

DR. STAN WIATR

Eastern Montana College, Billings

Chemical composition and energy content have been determined for leaves of leafy spurge (*Euphorbia esula*). The extraction method of Buchanan *et al* (1978: J. Am. Oil Chem 55:657) was employed to partition whole leaf tissue into four fractions: polyphenols, oils, hydrocarbons and residual biomass. Air-dried or lyophilized leaf tissue yielded 7-8% polyphenols, 11-12% oils, 0.2% hydrocarbons and 82% residual biomass. Drying fresh leaf tissue at 105° C prior to extraction reduced the polyphenol and oil yields to 3% and 7%, respectively. Extraction of fresh tissue gave a much higher yield of polyphenols (25%) with no appreciable difference in oils.

Based on calorimetric analyses, energy content of air-dried whole leaf tissue was 4873 cal/gm, polyphenols – 5070 cal/gm, oils – 9504 cal/gm and residual biomass – 4303 cal/gm. The apportionment of energy in air-dried leaf tissue was as follows: 5% polyphenals, 20% oil, 75% residual biomass. Hydrocarbons comprised less than 1% of the chemical bond energy associated with leaf tissue and therefore did not represent a significant energy resource associated with whole leaf biomass.

Based on a standing crop estimate of 5 tons/acre (shoot dry weight), production of extractives and residual biomass from leafy spurge would be on the order of 645 lb. polyphenols, 440 lb. oils, 45 lb. hydrocarbons and 8490 lb. residual biomass. It is noteworthy that these estimates do not take into consideration seasonal fluctuations in chemical composition and biomass apportionment throughout the plant.