Creating Sustainable Agroecosystems on Replaced Mining Overburden in Nikopol, Ukraine. (C03-gibson130405-Oral)

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Abstract:

Replaced overburden from strip mining in Ukraine frequently lacks topsoil, making productive use difficult. Soil factors limiting sustainability change with time after replacement and with different types of vegetation. Various sequences of legumes and legume-grass mixtures were used in trying to create a sustainable, minimum-input ecosystem following manganese mining in the Nikopol region of SE Ukraine. Five years of alfalfa followed by several years of a legume-grass mixture can prepare the reclaimed land for profitable crop production. Legume-rhizobium associations contribute substantial N to current and future N requirements of non-legumes. We are trying to determine the species mix, general management, and fertilization strategy that will provide the most vigorous and enduring growth of the legume-grass mix, resulting in maximum soil imporvement in the shortest time at a low cost and with fewest replantings of the mix. Challenges include alfalfa autotoxicity and phosphorous deficiency. It appears that biological mobilization of phosphorous can be improved by a small initial application of phosphorous and by encouragement of mycorrhizal associations.

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