REFERENCES

Aber, J.D., and Melillo, J.M. (1982) Nitrogen mineralization in decaying hardwood leaf litter as a function of initial nitrogen and lignin content. *Canadian Journal of Botany.* **60**, 2263-2269.

Aber, J.D., Melillo, J.M., and McClaugherty, C.A. (1990) Predicting long-term patterns of mass-loss, nitrogen dynamics and soil organic matter from initial litter chemistry. *Canadian Journal of Botany.* **68**, 2201-2208.

Abubakar, R., Goulding, K.W.T., Webster, C.P., Poulton, P.R., and Powlson, D.S. (1994) Estimating nitrate leaching and denitrification by simultaneous use of Br and N-15 tracers. *Journal of the Science of Food and Agriculture.* **66**, 509-519.

Adamsen. F.J., Bigelow, D.S., and Scott, G.R. (1985) Automated methods for ammonium, nitrate and nitrite in 2 M KCl- phenylmercuric acetate extracts of soil. *Communications in Soil Science and Plant Analysis.* **15**, 883-898.

Ajwa, H.A., and Tabatabai, M.A. (1994) Decomposition of different organic materials in soils. *Biology and Fertility of Soils.* **18**, 175-182.

Alexander, M. (1977) Organic matter decomposition. In 'Introduction to Soil Microbiology.' Wiley, New York pp. 128- 146.

Alexandratos, N. (1988) World Agriculture Toward 2000, An FAO Study. Belhaven Press., London

Allison, F.E. (1955) Does nitrogen applied to crop residues produce more humus ?. *Soil Science Society of America Journal.* **19**, 210-211.

Allison, F.E. (1973) Soil organic matter and its role in crop production. In 'Development in Soil Science.' Elsevier, New York

Allison, F.E., and Cover, R.G. (1960) Rates of decomposition of shortleaf pine sawdust in soil at various nitrogen and lime. *Soil Science.* **89**, 194-201.

Allison, F.E., and Klein, C.J. (1962) Rates of immobilization and release of nitrogen following additions of carbonaceous materials and nitrogen to soils. *Soil Science.* **93**, 383-386.

Allison, F.E., Sherman, M.S., and Pinck, L.A. (1949) Maintenance of soil organic matter I. Inorganic colloids as a factor in retention of carbon during formation of humus. *Soil Science.* **68**, 463-478.

Almendras, A.S., and Serohijos, R.C. (1995) Tree/Shrub legume residues in upland cropping systems in the Philippines. Soil Organic Matter Management for Sustainable Agriculture, ACIAR Proceedings No. 56. Ubonratchathani, Thailand, 24-26 August 1994. pp. 50-55. Eds. R. D. B. Lefroy, G. J. Blair, and E. T. Craswell., Canberra.

Amato, M., Jackson R.B., Butler, J.H.A., and Ladd, J.N. (1984) Decomposition of plant material in Australian soils. II. Residual organic ^{14}C and ^{15}N from legume plant parts decomposing under field and laboratory conditions. *Australian Journal of Soil Research.* **22**, 331-341.

Amato, M., and Ladd, J.N. (1980) Studies of nitrogen immobilization and mineralization in calcareous soils V. Formation and distribution of isotope-labelled biomass during decomposition of ^{14}C and ^{15}N-labelled plant materials. *Soil Biology and Biochemistry.* **12**, 405-411.

Amato, M., Ladd, J.N., Ellington, A., Ford, G., Mahoney, J.E., Taylor, A.C., and Walsgott, D. (1987) Decomposition of plant material in Australian soils. IV. Decomposition *in situ* of ^{14}C and ^{15}N-labelled legume and wheat materials in a range of Southern Australian soils. *Australian Journal of Soil Research.* **25**, 95-105.

Anderson, D.L., and Henderson, L.J. (1986) Sealed chamber digestion for plant nutrient analyses. *Agronomy Journal.* **78**, 837-839.

Anderson, D.W. (1995) Decomposition of organic matter and carbon emissions from soils. In 'Advances in Soil Science, Soils and Global Change.' Ed. R. Lal, J. Kimble, E. Levine, and B.A. Stewart CRC Press, Inc., Boca Raton, Florida pp. 165-175.

Anderson, J.M. (1973) The breakdown and decomposition of sweet chestnut (*Castanea sativa* Mill.) and beech (*Fagus sylvatica* L.) leaf litter in two deciduous woodland soils. II. Changes in the carbon, nitrogen and polyphenol content. *Oecologia.* **12**, 275- 288.

Anderson, J.M. (1988) The role of soil fauna in agricultural systems. In 'Advances in Nitrogen Cycling in Agricultural Ecosystems.' Ed. J.R. Wilson Commonwealth Agricultural Bureau, Wallingford pp. 89-112.

Anderson, J.M., Proctor, J., and Vallack, H.W. (1983) Ecological studies in four contrasting rain forests in Gunung Mulu National Park, Sarawak. III. Decomposition processes and nutrient losses from leaf litter. *Journal of Ecology.* **71**, 503- 527.

Andren, O., Lindberg, T., Bostrom, U., Clarholm, M., Hansson, A., Johansson, G., Lagerlof, J., Paustain, K., Persson, J., Petterson, R., Schnurer, J., Sohlenius, B., and Wivstad, M. (1990) Organic carbon and nitrogen flows. *Ecological Bulletins.* **40**, 85-126.

Andren, O., Steen, E., and Rajkai, K. (1992) Modelling the effects of moisture on barley straw and root decomposition in the field. *Soil Biology and Biochemistry.* **24**, 727-736.

Armstrong, R.D., Probert, M., and McCoster, K. (1996) Utilisation of nitrogen from plant residues and fertilizers by wheat in central Queensland farming systems. Proceedings of the 8th Australian Agronomy Conference, Agronomy - Science with Its Sleeves Rolled up The University of Southern Queensland, Toowoomba, Australia, 30 January - 2 February, 1996. pp. 143-149. Eds. M. Asghar. The Australian Society of Agronomy, Inc.

Arrouays, D., Balesdent, J., Mariotti, A., and Girardin, C. (1995) Modelling organic carbon turnover in cleared temperate forest soils converted to maize cropping by using C-13 natural abundance measurements. *Plant and Soil.* **173**, 191-196.

Arrouays, D., and Pelissier, P. (1994) Changes in carbon storage in temperate humic loamy soils after forest clearing and continuous corn cropping in France. *Plant and Soil.* **160**, 215- 223.

Arunin, S., Dissataporn, C., Anuluxtipan, Y., and Nana, D. (1988) Potential of *Sesbania* as a green manure in saline rice soils in Thailand. Sustainable Agriculture, Green Manure in Rice Farming. International Rice Research Institute, Philippines, 25- 29 May 1987. pp. 83-95. Eds. International Rice Research Institute. International Rice Research Institute

Aulakh, M.S., Doran, J.W., Walters, D.T., Mosier, A.R., and Francis, D.D. (1991) Crop residue type and placement effects on denitrification and mineralization. *Soil Science Society of America Journal.* **55**, 1020-1025.

Avalakki, U.K., Strong, W.M., and Saffigna, P.G. (1994) Measurement of gaseous emission from denitrification of applied nitrogen-15. II. Effects of temperature and added straw. *Australian Journal of Soil Research.* **33**, 89-99.

Ayanaba, A., Tuckwell, S.B., and Jenkinson, D.S. (1976) The effects of clearing and cropping on the organic matter reserves and biomass of a tropical forest soils. *Soil Biology and Biochemistry.* **8**, 519-525.

Azam, F., Simmons, F.W., and Mulvaney, R.L. (1993) Mineralization of N from plant residues and its interaction with native soil N. *Soil Biology and Biochemistry.* **25**, 1787-1792.

Bacon, P.E., Hoult, E.H., MaGarity, J.W., and Alter, D. (1989) Crop growth and nitrogen transformation in wheat (*Triticum aestivum* L.) planted after wetland rice (*Oryza sativa* L.). *Biology and Fertility of Soils.* **7**, 263-268.

Balesdent, J., Mariotti, A., and Boisgontier, D. (1990) Effect of tillage on soil organic matter mineralization estimated from ^{13}C abundance in maize fields. *Journal of Soil Science.* **41**, 587-596.

Balesdent, J., Mariotti, A., and Guillet, B. (1987). Natural ^{13}C abundance as a tracer for studies of soil organic matter dynamics. *Soil Biology and Biochemistry.* **19**, 25-30.

Barber, S.A. (1979) Corn residue management and soil organic matter. *Agronomy Journal.* **71**, 625-627.

Bassam, N.E.L., and Thorman, A. (November/December, 1980) Potentials and limits of organic wastes in crop production. *Compost Science/Land Utilisation.*, 30-35.

Bastian, R.K. (1977) EPA construction grants program. In 'Municipal Sludge Management.' Ed. R.C. Loehr Ann Arbor Publishers, Inc., Ann Arbor, Michigan pp. 110-123.

Bauer, A., and Black, A.L. (1981) Soil carbon, nitrogen and bulk density comparisons in two cropland tillage systems after 25 years and in virgin grassland. *Soil Science Society of America Journal.* **45**, 1166-1170.

Becker, M., Ladha, J.K., and Ottow, J.C.G. (1994) Nitrogen losses and lowland rice yield as affected by residue nitrogen release. *Soil Science Society of America Journal.* **58**, 1660-1665.

Bell, L.C., and Edwards, D.G. (1987) The role of aluminium in acid soil fertility. Soil Management under Humid Conditions in Asia and Pacific, IBSRAM Proceedings 5. pp. 201-223.

Berendse, F., Berg, B., and Bosatta, E. (1987) The effects of lignin and nitrogen on the decomposition of litter in nutrient-poor ecosystems : A theoretical approach. *Canadian Journal of Botany.* **65**, 1116-1120.

Bergersen, F.J., Turner, G.L., Gault, R.R., Peoples, M.B., Morthorpe, L.J., and Brockwell, J. (1992) Contribution of nitrogen in soybean crop residues to subsequent crops and to soils. *Australian Journal of Agricultural Research.* **43**, 155-169.

Bhowmik, P.C., and Doll, J.D. (1982) Corn and soybean response to allelopathic effects of weed and crop residue. *Agronomy Journal.* **74**, 601-606.

Biederbeck, V.O., Campbell, C.A., Bowren, K.E., Schnitzer, M., and McIver, R.N. (1980) Effect of burning cereal straw on soil properties and grain yields in Saskatchewan. *Soil Science Society of America Journal.* **44**, 103-111.

Biederbeck, V.O., Campbell, C.A., and Zentner, R.P. (1984) Effect of crop rotation and fertilization on some biological properties of a loam in Southwestern Saskatchewan. *Canadian Journal of Soil Science.* **64**, 355-367.

Bin, J. (1983) Utilization of green manure for raising soil fertility in China. *Soil Science.* **135**, 65-69.

Bingeman, C.W., Varner, J.E., and Martin, W.P. (1953) The effect of the addition of organic materials on the decomposition of an organic soil. *Soil Science Society of America Proceedings.* **17**, 34-38.

Black, A.L. (1973) Soil property changes associated with crop residue management in wheat-fallow rotation. *Soil Science Society of America Proceedings.* **37**, 943-946.

Blair, G.J., and Boland, O.W. (1978) The release of phosphorus from plant material added to soil. *Australian Journal of Soil Research.* **16**, 101-111.

Blair, G.J., Catchpoole, D., and Horne, P. (1990) Forage tree legumes: Their management and contribution to the nitrogen economy of wet and humid tropical environments. *Advances in Agronomy.* **44**, 27-55.

Blair, G.J., Chinoim, N., Lefroy, R.D.B., Anderson, G.C., and Crocker, G.J. (1991) A soil sulfur test for pastures and crops. *Australian Journal of Soil Research.* **29**, 619-626.

Blair, G.J., Conteh, A., and Lefroy, R.D.B. (1995a) Fate of organic matter and nutrients in upland agricultural systems. Soil Organic Matter Management for Sustainable Agriculture, ACIAR Proceedings No. 56. Ubonratchathani, Thailand, 24-26 August 1994. pp. 41-49. Eds. R. D. B. Lefroy, G. J. Blair, and E. T. Craswell., Canberra.

Blair, G.J., Lefroy, R.D.B., and Lisle, L. (1995b) Soil carbon fractions based on their degree of oxidation, and the development of a Carbon Management Index for agricultural systems. *Australian Journal of Agricultural Research.* **46**, 1459- 1466.

Blair, G., Lefroy, R., Konboon, Y., Wonprasaid, S., and Naklang, K. (1995c) Carbon and nutrient pools in rice cropping systems. Fragile Lives in Fragile Ecosystems Los Banos, Laguna, Philippines, 13-17 February 1995. pp. 161-172. Eds. International Rice Research Institute. International Rice Research Institute

Boerner, R.E.J. (1982) Fire and nutrient cycling in temperate ecosystems. *Bioscience.* **32**, 187-192.

Boerner, R.E.J., and Rebbeck, J. (1995) Decomposition and nitrogen release from leaves of three hardwood species grown under elevated O_3 and/or CO_2. *Plant and Soil.* **170**, 149-157.

Bonde, T.A., Christensen, B.T., and Cerri, C.C. (1992) Dynamics of organic matter as reflected by natural ^{13}C abundance in particle size fractions of forested and cultivated Oxisols. *Soil Biology and Biochemistry.* **24**, 275-277.

Boonchee, S. and Anecksamphant, C. (1993). Sustaining soil organic matter for upland rice production in Northern Thailand. Soil Organic Matter Dynamics And Sustainability Of Tropical Agriculture Leuven, Belgium, 4-6 November 1991. pp. 155-161. Ed K. Mulongoy and R. Merckx. John Wiley & Sons Ltd.: Baffins Lane, Chichester.

Bouldin, D.R. (1988) Effect of green manure on soil organic matter content and nitrogen availability. Sustainable Agriculture, Green Manure in Rice Farming International Rice Research Institute, Philippines, 25-29 May 1987. pp. 151-163. Eds. International Rice Research Institute. International Rice Research Institute

Bowman, R.A., and Focht, D.D. (1974) The influence of glucose and nitrate concentration upon denitrification rates in sandy soils. *Soil Biology and Biochemistry.* **6**, 297-301.

Breland, T. A. (1994). Measured and predicted mineralization of clover green manure at low temperatures at different depths in two soils. *Plant and Soil.* **166**, 13-20.

Bremer, E., Van Houtum, W., and Van Kessel, C. (1991) Carbon dioxide evolution from wheat and lentil residues as affected by grinding, added N, and the absence of soil. *Biology and Fertility of Soils.* **11**, 221-227.

Bremner, J. M. and Hauck, R. D. (1982). Advances in methodology for research in nitrogen transformations in soils. In 'Nitrogen in Agricultural Soils.' Ed F.J. Stevenson. pp 467-502, American Society of Agronomy: Madison, Wis.

Brewbaker, J.L., and Glover, N. (1988) Woody species as green manure crops in rice-based cropping systems. Sustainable Agriculture, Green Manure in Rice Farming. International Rice Research Institute, Philippines, 25-29 May 1987. pp. 29-43. Eds. International Rice Research Institute. International Rice Research Institute

Brewbaker, J.L., and Styles, B. (1982) Economically important nitrogen fixing tree species. In 'Nitrogen Fixing Tree Association Miscellaneous Publication 82-04.' Nitrogen Fixing Tree Association, Waimanalo, Hawaii, USA.

Broadbent, F.E. (1965) Effect of fertilizer nitrogen on the release of soil nitrogen. *Soil Science Society of America Proceedings.* **29**, 692-696.

Broadbent, F.E., and Bartholomew, W.V. (1948) The effect of quantity of plant material added to soil on its rate of decomposition. *Soil Science Society of America Proceedings.* **13**, 271-274.

Broadbent, F.E., and Nakashima, T. (1974) Mineralization of carbon and nitrogen in soil amended with carbon-13 and nitrogen- 15 labeled plant material. *Soil Science Society of America Proceedings.* **38**, 313-315.

Broadhurst, R.B., and Jones, W.T. (1978) Analysis of condensed tannins using acidified Vanillin. *Journal of the Science of Food and Agriculture.* **29**, 788-794.

Brooks, P.D., Stark, J.M., McInteer, B.B., and Preston, T. (1989) Diffusion method to prepare soil extracts for automated nitrogen-15 analysis. *Soil Science Society of America Journal.* **53**, 1707-1711.

Brown, S., and Lugo, A.E. (1990) Effects of forest clearing and succession on the carbon and nitrogen contents of soils in Puerto Rico and US virgin Islands. *Plant and Soil.* **124**, 53-64.

Buchanan, M., and King, L.D. (1993) Carbon and phosphorus losses from decomposing crop residues in no-till and conventional till agroecosystems. *Agronomy Journal.* **85**, 631-638.

Budelman, A. (1988) The decomposition of the leaf mulches of *Leucaena leucocephala, Gliricidia sepium* and *Flemingia macrophylla* under humid tropical condition. *Agroforestry Systems.* **7**, 33-45.

Budelman, A. (1989) *Flemingia macrophylla* - A valuable species in soil conservation. In 'NFT Highlights.' NFTA 89-04. Nitrogen Fixing Tree Association, Waimanalo, Hawaii, USA.

Burr, E.J. (1982) NEVA User's Manual., University of New England Computer Center, Armidale, N.S.W., Australia

Burton, R.L., and Burd, J.D. (1994) Effects of surface residues on insect dynamics. In 'Managing Agricultural Residues.' Ed. P.W. Unger CRC Press, Inc., U.S.A. pp. 245-283.

Cadisch, G., Ferreira, E., Urquiaga, S., Giller, K.E., and Boddey, R.M. (1993) Nitrogen turnover in a red Latosol: Effect of added carbon on the incorporation of ^{15}N into soil organic matter. Soil Organic Matter Dynamics and Sustainability of Tropical Agriculture Leuven, Belgium, 4-6

November 1991. pp. 209-213. Eds. K. Mulongoy and R. Merckx. John Wiley & Sons Ltd., Baffins Lane, Chichester.

Cadisch, G. and Giller, K. E. (1996). Short Communication : Estimating the contribution of legumes to soil organic matter build up in mixed communities of C3/C4 plants. *Soil Biology and Biochemistry* **28**, 823-825.

Cannell, R.Q., and Lynch, J.M. (1984) Possible adverse effects of decomposing crop residues on plant growth. In 'Organic Matter and Rice.' Ed. International Rice Research Institute, Los Banos, Laguna, Philippines pp. 455-475.

Catchpoole, D.W. (1988) The Contribution of Tree Legumes to the Nitrogen Economy and Forage Production in the Humid Tropics. University of New England, Armidale, N.S.W, Australia.

Cerri, C.C., Volkoff, B., and Andreux, F. (1991) Nature and behaviour of organic matter in soils under natural forest, and after deforestation, burning and cultivation, near Manaus. *Forest Ecology and management.* **38**, 247-257.

Cheng, W., and Coleman, D.C. (1990) Effect of living roots on soil organic matter decomposition. *Soil Biology and Biochemistry.* **22**, 781-787.

Cheshire, M.V. (1979) Nature and Origin of Carbohydrates in Soils. Academic Press, New York pp. 1-13.

Cheshire, M.V., and Chapman, S.J. (1996) Influences of the N and P status of plant material and of added N and P on the mineralization of C form ^{14}C-labelled ryegrass in soil. *Biology and Fertility of Soils.* **21**, 166-170.

Christensen, B.T. (1986) Barley straw decomposition under field conditions : Effect of placement and initial nitrogen content on weight loss and nitrogen dynamics. *Soil Biology and Biochemistry.* **18**, 523-529.

Christensen, B.T. (1985) Decomposibility of barley straw: effect of cold water extraction on dry weight and nutrient content. *Soil Biology and Biochemistry.* **17**, 93-97.

Cochran, V.L. (1991) Decomposition of barley straw in a subarctic soil in the field. *Biology and Fertility of Soils.* **10**, 227-232.

Cochran, V.L., Elliot, L.F., and Papendick, R.I. (1977) The production of phytotoxins from surface crop residues. *Soil Science Society of America Journal.* **41**, 903-908.

Collins, H.P., Rasmussen, P.E., and Douglas Jr, C.L. (1992) Crop rotation and residue management effects on soil carbon and microbial dynamics. *Soil Science Society of America Journal.* **56**, 783-788.

Condron, L.M., Tiessen, H., Trasar-Cepeda, C., Moir, J.O., and Stewart, J.W.B. (1993) Effects of liming on organic matter decomposition and phosphorus extractability in an acid humic Ranker soil from Northwest Spain. *Biology and Fertility of Soils.* **15**, 279-284.

Conteh, A.R. (1994) The Breakdown of Crop Residue in Soil, as Determined by Variations in ^{13}C Natural Abundance and Fractionation by Potassium Permanganate, and Its Effect on the Growth of Wheat. University of New England, Armidale, N.S.W., Australia.

Cortez, J., and Cherqui, A. (1991) Plant growth and the mineralization of adsorbed ^{14}C- and ^{15}N-labelled organic compounds. *Soil Biology and Biochemistry.* **23**, 261-267.

Cortez, J., Demard, J.M., Bottner, P., and Monrozier, L.J. (1996) Decomposition of Mediterranean leaf litters: A microcosm experiment investigating relationships between decomposition rates and litter quality. *Soil Biology and Biochemistry.* **28**, 443-452.

Cotrufo, M.F., Ineson, P., and Rowland, A.P. (1994) Decomposition of tree leaf litters grown under elevate CO_2 : Effect of litter quality. *Plant and Soil.* **163**, 121-130.

Couteaux, M.M., Bottner, P., and Berg, B. (1995) Litter decomposition, climate and litter quality. *Trends in Ecology & Evolution.* **10**, 63-66.

Dalal, R.C., Henderson, P.A., and Glasby, J.M. (1991) Organic matter and microbial biomass in a Vertisol after 20 years of zero tillage. *Soil Biology and Biochemistry.* **23**, 435-441.

Dalal, R.C., and Mayer, R.J. (1986) Long term trends in fertility of soils under continuous cultivation and cereal cropping in Southern Queensland. I. Overall changes in soil properties and trends in winter cereal yields . *Australian Journal of Soil Research.* **24**, 265-279.

De Datta, S.K. (1995) Nitrogen transformations in wetland rice ecosystems. *Fertilizer Research.* **42**, 193-203.

Diekmann, K.H., De Datta, S.K., and Ottow, J.C.G. (1993) Nitrogen uptake and recovery from urea and green manure in lowland rice measured by ^{15}N and non-isotope techniques. *Plant and Soil.* **148**, 91-99.

Doran, J.W., Wilhelm, W.W., and Power, J.F. (1984) Crop residue removal and soil productivity with no-till corn, sorghum and soybean. *Soil Science Society of America Journal.* **48**, 640- 645.

Dormaar, J.F. (1990) Effect of active roots on the decomposition of soil organic materials. *Biology and Fertility of Soils.* **10**, 121-126.

Doughton, J.A., and Mackenzie, J. (1984) Comparative effects of black and green gram (mung beans) and grain sorghum on soil mineral nitrogen and subsequent grain sorghum yields on the Eastern Darling Downs. *Australian Journal of Experimental Agriculture and Animal Husbandry.* **24**, 244-249.

Douglas, C.L., and Rickman, R.W. (1992) Estimating crop residue decomposition from air temperature, initial nitrogen content and residue placement. *Soil Science Society of America Journal.* **56**, 272-278.

Dursun, S., Ineson, P., Frankland, J.C., and Boddy, L. (1993) Sulphite and pH effects on CO_2 evolution from decomposing angiospermous and coniferous tree leaf litter. *Soil Biology and Biochemistry.* **25**, 1513-1525.

Enriquez, S., Duarte, C.M., and Sand-Jensen, K. (1993) Patterns in decomposition rates among photosynthetic organisms; The importance of detritus C:N:P content. *Oecologia.* **94**, 457- 471.

Eriksen, J., Lefroy, R.D.B., and Blair, G.J. (1995) Physical protection of soil organic sulfur studied using acetylacetone extraction at various intensities of ultrasonic dispersion. *Soil Biology and Biochemistry.* **27**, 1005-1010.

Fitzgerald, J.W., and Andrew, T.L. (1984) Mineralization of methionine sulphur in soil and forest floor layers. *Soil Biology and Biochemistry.* **16**, 565-570.

Flaig, W. (1984) Soil organic matter as a source of nutrients. In 'Organic Matter and Rice.' Ed. International Rice Research Institute, Los Banos, Laguna, Philippines pp. 73-92.

Flanagan, P.W., and Van Cleve, K. (1983) Nutrients in relation to decomposition and organic matter quality in Taiga ecosystems. *Canadian Journal of Soil Research.* **13**, 795-817.

Floate, M.J.S. (1970) Decomposition of organic materials from hill soils and pastures. II. Comparative studies on the mineralization of carbon, nitrogen and phosphorus from plant materials and sheep faeces. *Soil Biology and Biochemistry.* **2**, 173-185.

Fog, K. (1988) The effect of added nitrogen on the rate of decomposition of organic matter. *Biological Reviews.* **63**, 433- 462.

Fogel, R., and Cromack Jr., K. (1977) Effect of habitat and substrate quality on Douglas fir decomposition in Western Oregon. *Canadian Journal of Botany.* **55**, 1632-1640.

Follet, R.F., Gupta, S.C., and Hunt, P.G. (1987) Conservation practices: Relation to the management of plant nutrients for crop production. In 'Soil Fertility and Organic Matter as Critical Components of Production Systems.' SSSA Special Publication No 19 Ed. R.F. Follet, J.W.B. Stewart, and C.V. Cole Soil Science Society of America, Inc. and American Society of Agronomy, Inc., Publishers, Madison, WI, USA pp. 19-51.

Fox, R.H., Myers, R.J.K., and Vallis, I. (1990) The nitrogen mineralization rate of legume residues in soil as influenced by their polyphenol, lignin and N contents. *Plant and Soil.* **129**, 251-259.

Francis, G.S., Haynes, R.J., and Williams, P.H. (1994) Nitrogen mineralization, nitrate leaching and crop growth after ploughing-in leguminous and non-leguminous grain crop residues. *Journal of Agricultural Science.* **123**, 81-87.

Frankenberger, W.T.Jr, and Abdelmagid, H.M. (1985) Kinetic parameters of nitrogen mineralization rates of leguminous crops incorporated into soil. *Plant and Soil.* **87**, 257-271.

Franzluebbers, A.J., Hons, F.M., and Zuberer, D.A. (1994) Long-term changes in soil carbon and nitrogen pools in wheat management systems. *Soil Science Society of America Journal.* **58**, 1639-1645.

Freney, J.R. (1986) Forms and reactions of organic sulfur compounds in soils. In 'Sulfur in Agriculture, Agronomy Monograph 27.' Ed. M.A. Tabatabai Madison, Wisc., USA pp. 207-232.

Friesen, D.K., and Blair, G.J. (1988) A dual radiotracer study of transformations of organic, inorganic and plant residue phosphorus in soil in the presence and absence of plants. *Australian Journal of Soil Research.* **26**, 355-366.

Gabriels, D. (1988) Use of organic waste materials for soil structurization and crop production: Initial field experiment. *Soil Technology.* **1**, 89-92.

Gabriels, D., and Michiels, P. (1991) Soil organic matter and water erosion processes. Advances in Soil Organic Matter Research : The Impact on Agriculture & the Environment., 3-4 September 1990. pp. 141-152. Eds. W. S. Wilson. The Royal Society of Chemistry, Cambridge.

Gabriels, D., Michiels, P., Cadron, W., and Rejman, J. (1989) The use of organic waste materials and plant cover for soil surface protection and crop production. *Soil Technology.* **1**, 133-137.

Gallardo, A., and Merino, J. (1993) Leaf decomposition in two Mediterranean ecosystems of Southwest Spain: Influence of substrate quality. *Ecology.* **74**, 152-161.

Garrity, D.P., and Flinn, J.C. (1988) Farm-level management systems for green manure crops in Asian rice environments. Sustainable Agriculture, Green Manure in Rice Farming. International Rice Research Institute, Philippines, 25-29 May 1987. pp. 111-129. Eds. International Rice Research Institute. International Rice Research Institute

Gaur, A.C. (1980) Recycling of Organic Waste in Agriculture., New Delhi

Ghani, A., McLaren, R.G., and Swift, R.S. (1993) The incorporation and transformations of the ^{35}S in soil: Effects of soil conditioning and glucose or sulphate additions. *Soil Biology and Biochemistry.* **25**, 327-335.

Goering, H.K., and Van Soest, P.J. (1970) Forage fiber analysis. In 'Agricultural Handbook No 379.' USDA, Washington D.C. pp. 20 .

Goh, K.M. (1991) Bomb carbon. In 'Carbon Isotope Techniques.' Ed. D.C. Coleman and B. Fry Academic Press, San Diego, C.A pp. 147-151.

Green, C.J., and Blackmer, A.M. (1995) Residue decomposition effects on nitrogen availability to corn following corn or soybean. *Soil Science Society of America Journal.* **59**, 1065-1070.

Green, C.J., Blackmer, A.M., and Horton, R. (1995) Nitrogen effects on conservation of carbon during corn residue decomposition in soil. *Soil Science Society of America Journal.* **59**, 453-459.

Gupta, V.V.S.R., Grace, P.R., and Roper, M.M. (1994) Carbon and nitrogen mineralisation as influenced by long-term soil and crop residue management systems in Australia. In 'Defining Soil Quality for a Sustainable Environment.' SSSA Special Publication No 35 Ed. J.W. Doran, D.C. Coleman, D.F. Bezdicek, and B.A. Stewart Soil Science Society of America, Inc, Madison, Wisconsin, USA. pp. 193-200.

Hallam, M.J., and Bartholomew, W.V. (1953) Influence of rate of plant residue addition in accelerating the decomposition of soil organic matter. *Soil Science Society of America Proceedings.* **17**, 365-368.

Hamblin, A.P. (1985) The influence of soil structure on water movement, crop root growth, and water uptake. *Advances in Agronomy.* **38**, 95-158.

Hargrove, W.L., and Thomas, G.W. (1981) Effects of organic matter on exchangeable aluminium and plant growth in acid soils. In 'Chemistry in the Soil Environment.' Ed. M. Stelly American Society of Agronomy, Madison pp. 211-227.

Harper, S.H.T., and Lynch, J.M. (1981) The chemical composition and decomposition of wheat straw leaves, internodes and nodes. *Journal of the Science of Food and Agriculture.* **32**, 1057-1062.

Harris, M.M., and Safford, L.O. (1996) Effects of season and four tree species on soluble carbon content in fresh and decomposing litter of temperate forests. *Soil Science.* **161**, 130- 135.

He. D.Y., Liao, X.L., Xing, T.X., Zhou, W.J., Fang, Y.J., and He, L.H. (1994) The fate of nitrogen from ^{15}N-labelled straw and green manure in soil-crop-domestic animal systems. *Soil Science.* **158**, 65-73.

Herman, W.A., McGill, W.B., and Dormaar, J.F. (1977) Effects of initial chemical composition on decomposition of roots of three grass species. *Canadian Journal of Soil Science.* **57**, 205-215.

Herrera, W.T., Vejpas, C., Garrity, D.D., Sompaew, V., and Thongpan, N. (1989) Development of green manure technology for rainfed lowland rice on acid infertile soils in Northeast Thailand. Paper Presented at the Saturday IRRI Seminar.

Hesse, P.R. (1984) Potential of organic materials for soil improvement. In 'Organic Matter and Rice.' Ed. International Rice Research Institute, Los Banos, Laguna, Philippines pp. 35- 43.

Horner, G.M., Overson, M.M., Baker, G.O., and Pawson, W.W. (1960) USDA-ARS Bulletin No. 1.

Horton, R., Kluitenberg, J., and Bristow, K.L. (1994) Surface crop residue effects on the soil surface energy balance. In 'Managing Agricultural Residues.' Ed. P.W. Unger CRC Press, Inc., U.S.A pp. 143-162.

Howard, D.M., and Howard, P.J.A. (1993) Relationships between CO_2 evolution, moisture content and temperature for a range of soil types. *Soil Biology and Biochemistry.* **25**, 1537- 1546.

Hunt, H.W. (1977) A simulation model for decomposition in grasslands. *Ecology.* **58**, 469-484.

Ihori, T., Burke, I.C., Lauenroth, W.K., and Coffin, D.P. (1995) Effects of cultivation and abandonment on soil organic matter in Northeastern Colorado. *Soil Science Society of America Journal.* **59**, 1112-1119.

Iritani, W.M., and Arnold, C.Y. (1960) Nitrogen release of vegetable crop residues during incubation as related to their chemical composition. *Soil Science.* **89**, 74-82.

IRRI (1992) IRRISTAT Version 92-1. Ed. Biometrics Unit, International Rice Research Institute, Los Banos, Laguna Philippines

Janzen, H.H., and Kucey, R.M.N. (1988) C, N and S mineralization of crop residues as influenced by crop species and nutrient regime. *Plant and Soil.* **106**, 35-41.

Jedidi, N., Vancleemput, O., and Mhiri, A. (1995) Quantification of nitrogen mineralization and immobilization in soil in the presence of organic amendments. *Canadian Journal of Soil Science.* **75**, 85-91.

Jenkinson, D.S. (1981) The fate of plant and animal residues in soil. In 'The Chemistry of Soil Processes.' Ed. D.A. Greenland and M.H.B. Hayes. John Wiley, Chichester pp. 505- 561.

Jenkinson, D.S. (1988) Soil organic matter and its dynamics. In 'Russell's Soil Condition and Plant Growth, Eleventh Edition.' Ed. A. Wild Longman Scientific and Technical, London pp. 564-607.

Jenkinson, D.S. (1965) Studies on the decomposition of plant material in soil. I. Losses of carbon from ^{14}C labelled rye-grass incubated with soil in the field. *Journal of Soil Science.* **16**, 104-115.

Jenkinson, D.S. (1966) Studies on the decomposition of plant material in soil. II. Partial sterilization of soil and the soil biomass. *Journal of Soil Science.* **17**, 280-302.

Jenkinson, D.S. (1977) Studies on the decomposition of plant material in soil. IV. The effect of rate of addition. *Journal of Soil Science.* **28**, 417-423.

Jenkinson, D.S., and Ayanaba, A. (1977) Decomposition of carbon-14 labelled plant material under tropical conditions. *Soil Science Society of America Journal.* **41**, 912-915.

Jenkinson, D.S., and Ladd, N.J. (1981) Microbial biomass in soil: Measurement and turnover. In 'Soil Biochemistry.' Ed. E.A. Paul and N.J. Ladd Dekker, New York

Jenny, H. (1941) Factors of Soil Formation. McGraw-Hill, New York

Jenny, H., Gessel, S.P., and Bingham, F.T. (1949) Comparative study of decomposition of organic matter in temperate and tropical regions. *Soil Science.* **68**, 419-432.

Jensen, E.S. (1994) Availability of nitrogen in ^{15}N- labelled mature pea residues to subsequent crops in the field. *Soil Biology and Biochemistry.* **26**, 465-472.

Jensen, E.S. (1991) Evaluation of automated analysis of ^{15}N and total N in plant material and soil. *Plant and Soil.* **133**, 83- 92.

Jensen, E.S. (1992) The release and fate of nitrogen from catch-crop materials decomposing under field conditions. *Journal of Soil Science.* **43**, 335-345.

Jessop, R.S., and Stewart, L.W. (1983) Effects of crop residues, soil type and temperature on emergence and early growth of wheat. *Plant and Soil.* **74**, 101-109.

Jones, L.H.P., and Jarvis, S.C. (1981) The fate of heavy metals. In 'The Chemistry of Soil Processes.' Ed. D.J. Greenland, and M.H.B. Hayes Wiley, Chichester pp. 593-620.

Jordan, D., Bruce, R.R., and Coleman, D.C. (1996) Nitrogen availability to grain sorghum from organic and inorganic sources on sandy and clayey soil surfaces in a greenhouse pot study. *Biology and Fertility of Soils.* **21**, 271-276.

Kachaka, S., Vanlauwe, B., and Merckx, R. (1993) Decomposition and nitrogen mineralization of prunings of different quality. Soil Organic Matter Dynamics and Sustainability of Tropical Agriculture Leuven, Belgium, 4-6 November 1991. pp. 199-208. Eds. K. Mulongoy and R. Merckx. John Wiley & Sons Ltd., Baffins Lane, Chichester.

Kalburtzi, K.L., Veresoglou, D.S., and Vokou, D. (1990) Decomposition and nutrient release from wheat and fababean straw under field conditions. *Agriculture, Ecosystems & Environment.* **30**, 107-120.

Kamukondiwa, W., and Bergstrom, L. (1994) Leaching and crop recovery of ^{15}N from ammonium sulfate and labelled maize (*Zea mays*) material in lysimeters at a site in Zimbabwe. *Plant and Soil.* **162**, 193-201.

Kanal, A. (1995) Effect of incorporation depth and soil climate on straw decomposition rate in a loamy Podzoluvisol. *Biology and Fertility of Soils.* **20**, 190-196.

Kevan, D.K.M. (1968) Soil Animals. Witherby, London

Keya, S.O. (1975) Microbial Practicals. In 'Technical Communication No 6.' Department of Soil Science, University of Nairobi, Kenya pp. 22 .

Keyser, P., Kirk, T.K., and Ziekus, J.G. (1978) Lignolytic enzyme system of *Phanerochaete chrysosporium*: Synthesized in the absence of lignin in response to nitrogen starvation. *Journal of Bacteriology.* **135**, 790-797.

Khan, S.U. (1970) Enzyme activity in a grey wooded soil as influenced by cropping systems and fertilizers. *Soil Biology and Biochemistry.* **2**, 137-139.

Kimber, R.W.L. (1973) Phytotoxicity from plant residues. II. The relative effect of toxins and nitrogen immobilization on the germination and growth of wheat. *Plant and Soil.* **38**, 543- 555.

Kimura, M.I., Watanabe, P., Patcharapreecha, P., Panichsakpatana, S., Wada, H., and Takai, Y. (1990) Quantitative estimation of decomposition process of plant debris in paddy field. II. Amounts and C/N ratios of plant debris in tropical paddy soils. *Soil Science and Plant Nutrition.* **36**, 33-42.

King, J.A., and Campbell, B.M. (1994) Soil organic matter relations in five land cover types in the Miombo region (Zimbabwe). *Forest Ecology and Management.* **67**, 225-239.

Kladivko, E.J. (1994) Residue effects on soil physical properties. In 'Managing Agricultural Residues.' Ed. P.W. Unger CRC Press, Inc., U.S.A pp. 123-141.

Knapp, E.B., Elliott, L.F., and Campbell, G.S. (1983) Carbon, nitrogen, and microbial biomass interrelationships during the decomposition of wheat straw: A mechanistic simulation model. *Soil Biology and Biochemistry.* **15**, 455-461.

Konboon, Y. (Unpublished Data-a) Decomposition and nutrient release from leaves and stem of two legumes as studied by perfusion technique.

Konboon, Y. (Unpublished Data-b) Decomposition and nutrient release from cut and uncut residue as studied by perfusion technique.

Kononova, M.M. (1966) Soil Organic Matter. Pergamon, Oxford

Kowalenko, C.G., Ivarson, K.C., and Cameron, D.R. (1978) Effect of moisture content, temperature and nitrogen fertilization on carbon dioxide evolution from field soils. *Soil Biology and Biochemistry.* **10**, 417-423.

Kumazawa, K. (1984) Beneficial effects of organic matter on rice growth and yield in Japan. In 'Organic Matter and Rice.' Ed. International Rice Research Institute, Los Banos, Laguna, Philippines pp. 431-444.

Kurihara, K. (1984) Urban and industrial wastes as fertilizer materials. In 'Organic Matter and Rice.' Ed. International Rice Research Institute, Los Banos, Laguna, Philippines pp. 193-215.

Ladd, J.N. (1981) The use of 15-N in following organic matter turnover, with special reference to rotation systems. *Plant and Soil.* **58**, 401-411.

Ladd, J.N., Amato, M., Jackson, R.B., and Butler, J.H.A. (1983) Utilization by wheat crops of nitrogen from legume residues decomposing in soils in the field. *Soil Biology and Biochemistry.* **15**, 231-238.

Ladd, J.N., Amato, M., Li-kai, Z., and Schultz, J.E. (1994) Differential effects of rotation, plant residue and nitrogen fertilizer on microbial biomass and organic matter in an Australian Alfisol. *Soil Biology and Biochemistry.* **26**, 821-831.

Ladd, J.N., Amato, M., and Oades, J.M. (1985) Decomposition of plant material in Australian soils. III. Residual organic and microbial biomass C and N from isotope-labelled legume material and soil organic matter, decomposing under field conditions. . *Australian Journal of Soil Research.* **23**, 603-611.

Ladha, J.K., Watanabe, I., and Saono, S. (1988) Nitrogen fixation by leguminous green manure and practices for its enhancement in tropical lowland rice. Sustainable Agriculture, Green Manure

in Rice Farming. International Rice Research Institute, Philippines, 25-29 May 1987. pp. 165-183. Eds. International Rice Research Institute. International Rice Research Institute

Lal, R. (1986) Soil surface management in the tropics for intensive land use and high and sustained production. *Advances in Soil Science.* **5**, 1-109.

Lal, R., Kimble, J., Levine, E., and Whitman, C. (1995) World soils and greenhouse effects: An overview. In 'Soils and Global Change.' Ed. R. Lal, J. Kimble, E. Levine, and B.A. Stewart CRC Press, Inc., Boca Raton, Florida pp. 1-7.

Larson, W.E., Clapp, C.E., Pierre, W.H., and Morachan, Y.B. (1972) Effects of increasing amounts of organic residues on continuous corn. II. Organic carbon, nitrogen, phosphorus and sulfur. *Agronomy Journal.* **64**, 204-208.

Latter, P.M., and Howson, G. (1977) The use of cotton strips to indicate cellulose decomposition in the field. *Pedobiologia.* **17**, 145-155.

Lee, K.E., and Pankhurst, C.E. (1992) Soil organisms and sustainable productivity. *Australian Journal of Soil Research.* **30**, 855-892.

Lee, K.E., and Wood, T.G. (1971) Termites and Soils. Academic Press, London

Lefroy, R.D.B., Blair, G.J., and Conteh, A. (1995) Chemical fractionation of soil organic matter and measurement of the breakdown rate of residues. Soil Organic Matter Management for Sustainable Agriculture, ACIAR Proceedings No. 56. Ubonratchathani, Thailand, 24-26 August 1994. pp. 149-158. Eds. R. D. B. Lefroy, G. J. Blair, and E. T. Craswell., Canberra.

Lefroy, R.D.B., Blair, G.J., and Strong, W.M. (1993) Changes in soil organic matter with cropping as measured by organic carbon fractions and ^{13}C natural isotope abundance. *Plant and Soil.* **155-156**, 399-402.

Lefroy, R.D.B., Blair, G.J., and Whitbread, A.M. (1996) Soil carbon fractions as a land quality indicator. Abstracts of Oral Presentations and Posters, Advances in Soil Quality for Land Management: Science, Practice and Policy: An International Symposium University of Ballarat, Ballarat, Australia, 19-17 April 1996. pp. 38.

Lefroy, R.D.B., Chaitep, W., and Blair, G.J. (1994) Release of sulfur from rice residues under flooded and non-flooded soil conditions. *Australian Journal of Agricultural Research.* **45**, 657-667.

Lefroy, R.D.B. and Craswell, E.T. (1996) Sustainable agriculture and natural resource management. The International Conference on Nutrient Management for Sustainable Food Production in Asia Bali, Indonesia., 9-12 December 1996.

Lehmann, J., Schroth, G., and Zech, W. (1995) Decomposition and nutrient release from leaves, twigs and roots of three alley- cropped tree legumes in Central Togo. *Agroforestry Systems.* **29**, 21-36.

Li, S. (1984) *Azolla* in the paddy fields of Eastern China. In 'Organic Matter and Rice.' Ed. International Rice Research Institute, Los Banos, Laguna, Philippines pp. 169-178.

Liang, B.C., Gregorich, E.G., and MacKenzie, A.F. (1996) Modelling the effects of inorganic and organic amendments on organic matter in a Quebec soil. *Soil Science.* **161**, 109-114.

Liang, B.C., and MacKenzie, A.F. (1992) Changes in soil organic carbon and nitrogen after six years of corn production. *Soil Science.* **153**, 307-313.

Loginow, W., Wisniewski, W., Gonet, S.S., and Ciescinska, B. (1987) Fractionation of organic carbon based on susceptibility to oxidation. *Journal of Soil Science.* **20**, 47-52.

Lueken, H., Hutcheon, W.L., and Paul, E.A. (1962) The influence of nitrogen on the decomposition of crop residues in the soil. *Canadian Journal of Soil Science.* **42**, 276-288.

Lugo, A.E., Sanchez, M.J., and Brown, S. (1986) Land use and organic carbon content of some subtropical soils. *Plant and Soil.* **96**, 185-196.

Lynch, J.M. (1979) Straw residues as substrates for growth and product formation by soil microorganisms. In 'Straw Decay and Its Effect on Disposal and Utilization.' Ed. E. Grossbard Wiley, New York pp. 47-56.

Ma, J.F., and Takahashi, E. (1989) Release of silicon from rice straw under flooded conditions. *Soil Science and Plant Nutrition.* **35**, 663-667.

Mann, L.K. (1986) Changes in soil carbon storage after cultivation. *Soil Science.* **142**, 279-288.

Martin, A., Mariotti, A., Balesdent, J., Lavelle, P., and Vuattoux, R. (1990) Estimated of organic matter turnover rate in a savanna soil by ^{13}C natural abundance measurements. *Soil Biology and Biochemistry.* **22**, 517-523.

Mary, B., Mariotti, A., and Morel, J.L. (1992) Use of 13-C variations at natural abundance for studying biodegradation of root mucilage, roots and glucose in soils. *Soil Biology and Biochemistry.* **24**, 1065-1072.

Matta-Machado, R.P., Neely, C.L., and Cabrera, M.L. (1994) Plant residue decomposition and nitrogen dynamics in an alley cropping and an annual legume-based cropping system. *Communications in Soil Science and Plant Analysis.* **25**, 3365- 3378.

McClaugherty, C.A., Pastor, J., Aber, J.D., and Melillo, J.M. (1985) Forest litter decomposition in relation to soil nitrogen dynamics and litter quality. *Ecology.* **66**, 266-275.

McGill, W.B., Cannon, K.R., Robertson, J.A., and Cook, F.D. (1986) Dynamics of microbial biomass and water-soluble organic C in Breton L after 50 years of cropping to two rotations. *Canadian Journal of Soil Science.* **66**, 1-19.

McGill, W.B., and Myers, R.J.K. (1987) Controls on dynamics of soil and fertilizer nitrogen. In 'Soil Fertility and Organic Matter as Critical Components of Production Systems, SSSA Special Publication No 19.' Ed. R.F. Follett, J.W.B. Stewart, and C.V. Cole Soil Science Society of

America, Inc. and American Society of Agronomy, Inc., Publishers , Madison, WI, USA. pp. 73-99.

Meelu, O.P., and Morris, R.A. (1988) Green manure management in rice-based cropping systems. Sustainable Agriculture, Green Manure in Rice Farming International Rice Research Institute, Philippines, 25-29 May 1987. pp. 209-222. Eds. International Rice Research Institute. International Rice Research Institute

Meentemeyer, V. (1978) Macroclimate and lignin control of litter decomposition. *Ecology.* **59**, 465-472.

Melillo, J.M., Aber, J.D., and Musatore, J.F. (1982) Nitrogen and lignin control of hardwood leaf litter decomposition dynamics. *Ecology.* **63**, 621-626.

Miller, M.H., Beauchamp, E.G., and Lauzon, J.D. (1994) Leaching of nitrogen and phosphorus from the biomass of three cover crop species. *Journal of Environmental Quality.* **23**, 267- 272.

Monreal, C., and Janzen, H.H. (1993) Soil organic carbon dynamics after 80 years of cropping a Dark Brown Chernozem. *Canadian Journal of Soil Science.* **73**, 133-136.

Moore, T.R. (1984) Litter decomposition in a subarctic spruce-lichen woodland, Eastern Canada. *Ecology.* **65**, 299-308.

Mote, R.C., and Griffis, C.L. (1980) Variations in the composting process for different organic carbon sources. *Agricultural Wastes.* **2**, 215-223.

Muller, M.M., and Sundman, V. (1988) The fate of nitrogen (^{15}N) released from different plant materials during decomposition under field conditions. *Plant and Soil.* **105**, 133- 139.

Muller, M.M., Sundman, V., Soininvaara, O., and Merilainen, A. (1988) Effect of chemical composition on the release of nitrogen from agricultural plant materials during decomposing in soil under field conditions. *Biology and Fertility of Soils.* **6**, 78-83.

Myers, R.J.K., Palm, C.A., Cuevas, E., Gunatilleke, I.U.N., and Brossard, M. (1994) The synchronisation of nutrient mineralisation and plant nutrient demand. In 'The Management of tropical Soil Biology and Fertility.' Ed. P.L. Woomer, and M.J. Swift John Wiley and Sons pp. 81-116.

Neue, H. and Scharpenseel, H. (1984) Gaseous products of the decomposition of organic matter in submerged soils. In 'Organic Matter and Rice.' Ed. International Rice Research Institute, Los Banos, Laguna, Philippines pp. 311-328.

Nicolardot, B., Fauvet, G., and Cheneby, D. (1994) Carbon and nitrogen cycling through soil microbial biomass at various temperatures. *Soil Biology and Biochemistry.* **26**, 253-261.

Norton, B.W. (1982) Differences between species in forage quality. In 'Nutritional Limits to Animal Production from Pastures.' Ed. J.B. Hacker CAB, Farnham Royal, U.K. pp. 89-110.

Nowak, G., and Nowak, J. (1990) Turnover of ^{14}C-labelled oat residues and small molecular organic compounds in two soils under different levels of mineral nutrition. *Plant and Soil.* **122**, 67-77.

Nyamai, D.O. (1992) Investigations on decomposition of foliage of woody species using a perfusion method. *Plant and Soil.* **139**, 239-245.

Obatolu, C.R., and Agboola, A.A. (1993) The potential of Siam weed (*Chromolaena odorata*) as a source of organic matter for soils in the humid tropics. Soil Organic Matter Dynamics and Sustainability of Tropical Agriculture Leuven, Belgium, 4-6 November 1991. pp. 89-99. Eds. K. Mulongoy and R. Merckx. John Wiley & Sons Ltd., Baffins Lane, Chichester.

O'Brien, B.J. (1984) Soil organic carbon fluxes and turnover rates estimated from radiocarbon enrichments. *Soil Biology and Biochemistry.* **16**, 115-120.

O'Brien, B.J., and Stout, J.D. (1978) Movement and turnover of soil organic matter as indicated by carbon isotope measurements. *Soil Biology and Biochemistry.* **10**, 309-317.

Oglesby, K.A., and Fownes, J.H. (1992) Effects of chemical composition on nitrogen mineralization from green manures of seven tropical leguminous trees. *Plant and Soil.* **143**, 127-132.

Oweezkin, L.J., Kerven, G.L., and Ostatek-Boezynski, Z. (1996) The determination of dissolved organic carbon by Inductively Coupled Plasma Atomic Emission Spectroscopy. *Communications in Soil Science and Plant Analysis.* **27**, 47-55.

Palm, C.A., and Sanchez, P.A. (1990) Decomposition and nutrient release patterns of the leaves of three tropical legumes. *Biotropica.* **22**, 330-338.

Palm, C.A., and Sanchez, P.A. (1991) Nitrogen release from some tropical legumes as affected by lignin and polyphenol contents. *Soil Biology and Biochemistry.* **23**, 83-88.

Parnas, H. (1975) Model for decomposition of organic material by microorganisms. *Soil Biology and Biochemistry.* **7**, 161-169.

Parr, J.F., and Papendick, R.I. (1978) Factors affecting the decomposition of crop residues by microorganisms. In 'Crop Residue Management Systems.' Ed. W.R. Oschwald American Society of Agronomy, Madison, Wisconsin. pp. 101-129.

Parr, J.F., Smith, S., and Willis, G.H. (1970) Soil anaerobiosis. I. Effects of selected environments and energy sources on respiratory activity of soil micro-organisms. *Soil Science.* **110**, 37-43.

Parton, W.J., Schimel, D.S., Cole, C.V., and Ojima, D.S. (1987) Analysis of factors controlling soil organic matter levels in Great Plains grasslands. *Soil Science Society of America Journal.* **51**, 1173-1179.

Patrick, Z.A., Toussoun, T.A., and Snyder, W.C. (1963) Phytotoxic substances in arable soils associated with decomposition of plant residues. *Phytopathology.* **53**, 152-161.

Paul, E.A., and Clark, F.E. (1989) Soil Microbiology and Biochemistry. Academic Press, Inc., London

Paul, J.W., and Beauchamp, E.G. (1989) Denitrification and fermentation in plant-residue-amended soil. *Biology and Fertility of Soils.* **7**, 303-309.

Peevy, W.J., and Norman, A.G. (1948) Influence of composition of plant materials on properties of the decomposed residues. *Soil Science.* **65**, 209-226.

Pinck, L.A., and Allison, F.E. (1951) Maintenance of soil organic matter. III. Influence of green manures on the release of native soil carbon. *Soil Science.* **71**, 67-75.

Pinstrup-Anderson, P. and Pandya-Lorch, R. (1994) Alleviating poverty, intensifying agriculture, and effectively managing natural resources. *A 2020 Vision for Food, Agriculture and the Environment. Discussion Paper No. 1.* International Food Policy Research Institute, Washington D.C.

Ponnamperuma, F.N. (1984) Straw as source of nutrients for wetland rice. In 'Organic Matter and Rice.' Ed. International Rice Research Institute, Los Banos, Laguna, Philippines pp. 117-136.

Putnam, A.R. (1994) Phytotoxicity of plant residues. In 'Managing Agricultural Residues.' Ed. P.W. Unger CRC Press, Inc., U.S.A pp. 285-314.

Radke, J.K., and Honeycutt, C.W. (1994) Residue management strategies in the Northeast. In 'Crop Residue Management.' Special Publication No. 9 Ed. J.L. Hatfield and B.A. Stewart CRC Press, Inc., Boca Raton, Florida pp. 77-107.

Rafter, T.A., and Stout, J.D. (1970) Radiocarbon measurements as an index of the rate of turnover of organic matter in forest and grassland ecosystems in New Zealand. Radiocarbon Variations and Absolute Chronology, Proceedings of the Twelfth Nobel Symposium. Uppsala, Sweden. pp. 401-417. Eds. I.U. Olsson. Wiley & Sons, Inc., New York.

Ranjhan, S.K. (1986) Sources of feed for ruminant production in Southeast Asia. Forages in Southeast Asian and South Pacific Agriculture, Proceedings of an International Workshop, ACIAR Proceedings No. 12 Cirarua, Indonesia, 19-23 August 1985. pp. 24-28. Eds. G. J. Blair, D. A. Ivory, and T. R. Evans.

Rasmussen, P.E., Allmaras, R.R., Rohde, C.R., and Roager Jr., N.C. (1980) Crop residue influences on soil carbon and nitrogen in a wheat-fallow system. *Soil Science Society of America Journal.* **44**, 596-600.

Rasmussen, P.E., and Collins, H.P. (1991) Long-term impacts of tillage, fertilizer, and crop residue on soil organic matter in temperate semi-arid regions. *Advances in Agronomy.* **45**, 93- 134.

Rasmussen, P.E., and Parton, W.J. (1994) Long-term effects of residue management in wheat-fallow: I Inputs, yield and soil organic matter. *Soil Science Society of America Journal.* **58**, 523-530.

Reddy, M.V., Reddy, V.R., Yule, D.F., Cogle, A.L., and George, P.J. (1994) Decomposition of straw in relation to tillage, moisture, and arthropod abundance in a semi-arid tropical Alfisol. *Biology and Fertility of Soils.* **17**, 45-50.

Reinertsen, S.A., Elliott, L.F., Cochran, V.L., and Campbell, G.S. (1984) Role of available carbon and nitrogen in determining the rate of wheat straw decomposition. *Soil Biology and Biochemistry.* **16**, 459-464.

Robinson, C.A., Cruse, R.M., and Ghaffarzadeh, M. (1996) Cropping system and nitrogen effects on Mollisol organic carbon. *Soil Science Society of America Journal.* **60**, 264-269.

Roger, P.A. and Watanabe, I. (1984) Algae and aquatic weeds as source of organic matter and plant nutrients for wetland rice. In 'Organic Matter and Rice.' Ed. International Rice Research Institute, Los Banos, Laguna, Philippines pp. 147-167.

Rose, D.A. (1991) The effect of long-continued organic manuring on some physical properties of soils. Advances in Soil Organic Matter Research : The Impact on Agriculture & the Environment., 3-4 September 1990. pp. 197-205. Eds. W. S. Wilson. The Royal Society of Chemistry, Cambridge.

Rosegrant, M.W., and Roumasset, J.A. (1988) Economic feasibility of green manure in rice-based cropping systems. Sustainable Agriculture, Green Manure in Rice Farming, 25-29 May 1987. pp. 11-27. Eds. International Rice Research Institute. International Rice Research Institute, Philippines

Saffigna, P.G., Powlson, D.S., Brookes, P.C., and Thomas, G. (1989) Influence of sorghum residues and tillage on soil organic matter and soil microbial biomass in an Australian Vertisol. *Soil Biology and Biochemistry.* **21**, 759-765.

Saini, R.C. (1989) Mass loss and nitrogen concentration changes during the decomposition of rice residues under field conditions. *Pedobiologia.* **33**, 229-235.

Sanchez, P.A., Benites, J., and Bandy, D.E. (1987) Low- input systems and managed fallows for acid soils in the humid tropics. Proceedings of the First Regional Seminar on Soil Management under Humid Conditions in Asia. IBSRAM, Thailand pp. 297-316. Eds. M. Latham., Thailand.

Sanchez, P.A., Palm, C.A., Szott, L.T., Cuevas, L.T., and Lal, R. (1989) Organic input management in tropical agroecosystems. In 'Dynamics of Soil Organic Matter in Tropical Ecosystems.' Ed. D.C. Coleman, J.M. Oades, and G. Uehera University of Hawaii Press, Honolulu, Hawaii pp. 125-152.

Sauerbeck, D.R., and Gonzales, M.A. (1977) Field decomposition of carbon-14-labelled plant residues in various soils of the Federal Republic of Germany and Costa Rica. In 'Soil Organic Matter Study.' 1 pp. 159-170.

Schipper, L.A., Harfoot, C.G., McFarlane, P.N., and Cooper, A.B. (1994) Anaerobic decomposition and denitrification during plant decomposition in an organic soil. *Journal of Environmental Quality.* **23**, 923-928.

Schnitzer, M. (1991) Soil organic matter - The next 75 years. *Soil Science.* **151**, 41-58.

Schnitzer, M., and Khan, S.U. (1972) Humic Substances in the Environment. Marcel Dekker, New York

Schollenberger, C.J. (1927) A rapid approximate method for determining soil organic matter. *Soil Science.* **24**, 65-68.

Schomberg, H.H., Steiner, J.L., and Unger, P.W. (1994) Decomposition and nitrogen dynamics of crop residues: Residue quality and water effects. *Soil Science Society of America Journal.* **58**, 372-381.

Schwartz, D., Mariotti, A., Lanfranchi, R., and Guillet, B. (1986) $^{13}C/^{12}C$ ratios of soil organic matter as indicators of vegetation changes in the Congo. *Geoderma.* **39**, 97-103.

Senaratne, R., and Ratnasinghe, D.S. (1995) Nitrogen fixation and beneficial effects of some grain legumes and green manure crops on rice. *Biology and Fertility of Soils.* **19**, 49-54.

Sivapalan, K., Fernando, V., and Thenabadu, M.W. (1985) Nitrogen mineralization in polyphenol-rich-plant residues and their effect on nitrification of applied ammonium sulfate. *Soil Biology and Biochemistry.* **17**, 547-551.

Skjemstad, J.O., Le Feuvre, R.P., and Prebble, R.E. (1990) Turnover of soil organic matter under pasture as determined by ^{13}C natural abundance. *Australian Journal of Soil Research.* **28**, 267-276.

Smith, V.R., Steenkamp, M., and French, D.D. (1993) Soil decomposition potential in relation to environmental factors on Marion island (sub-antarctic). *Soil Biology and Biochemistry.* **25**, 1619-1633.

Sommers, L.E., Gilmour, C.M., Wildung, R.E., and Beck, S.M. (1981) The effect of water potential on decomposition processes in soils. In 'Water Potential Relations in Soil Microbiology.' Special Publication No. 9 Ed. J.F. Parr, W.R. Gardner, and L.F. Elliott Soil Science Society of America pp. 97-117.

Sorensen, L.H. (1981) Carbon-nitrogen relationships during the humification of cellulose in soil containing different amounts of clay. *Soil Biology and Biochemistry.* **13**, 313-321.

Sorensen, L.H. (1963) Studies on the decomposition of carbon-14 labelled barley straw in soil. *Soil Science.* **95**, 45- 51.

Sowden, F.J. (1968) Effect of long-term annual additions of various organic amendments on the organic matter of a clay and sand. *Canadian Journal of Soil Science.* **48**, 331-339.

Stanford, G., and Epstein, E. (1974) Nitrogen mineralization - Water relations in soil. *Soil Science Society of America Proceedings.* **38**, 103-106.

Stevenson, F.J. (1986) Cycles of Soil; Carbon, Nitrogen, Phosphorus, Sulfur, Micronutrients. John Wiley and Sons, New York

Stevenson, F.J. (1982) Humus Chemistry: Genesis, Composition, and Reactions. Wiley, New York pp. 433.

Stewart, B.A., Porter, L.K., and Viets, F.G.Jr (1966) Effect of sulfur content of straws on rates of decomposition and plant growth. *Soil Science Society of America Proceeding.* **30**, 355-358.

Stout, J.D., and O'Brien, B.J. (1973) Factors affecting radiocarbon enrichment in soil and the turnover of soil organic matter. Proceedings of the Eight International Radiocarbon Dating Conference. Lower Hutt, New Zealand, 18-25 October 1972. pp. 394-407.

Strickland, T.C., Fitzgerald, J.W., and Swank, W.T. (1986) *In situ* immobilization of ^{35}S-labelled organic sulphur in litter and soil from a hardwood forest. *Soil Biology and Biochemistry.* **18**, 463-468.

Strong, W.M., Dalal, R.C., Cooper, J.E., and Saffigna, P.C. (1987) Availability of residual fertilizer nitrogen in a Darling Downs black earth in a presence and absence of wheat straw. *Australian Journal of Experimental Agriculture.* **27**, 295-302.

Strong, W.M., Harbison, J., Nielson, R.G.H., Hall, B.D., and Best, E.K. (1986) Nitrogen availability in a Darling Downs soil following cereal, oilseed and grain legume crops. II. Effects of residual soil nitrogen and fertilizer nitrogen on subsequent wheat crops. *Australian Journal of Experimental Agriculture.* **26**, 353-359.

Sumberg, J.E. (1985) Note on estimating the foliage yield of two tropical browse species. *Tropical Agriculture.* **62**, 15-16.

Summerell, B.A., and Burgess, L.W. (1989) Decomposition and chemical composition of cereal straw. *Soil Biology and Biochemistry.* **21**, 551-559.

Sutrisno, Arifandi, Y.A., Till, A.R., Nursasongko, Winarso, S., and Blair, G.J. (1995) The role of mulches and terracing in crop production and water, soil and nutrient management in East Java, Indonesia. Soil Organic Matter Management for Sustainable Agriculture, ACIAR Proceedings No. 56. Ubonratchathani, Thailand, 24-26 August 1994. pp. 15-20. Eds. R. D. B. Lefroy, G. J. Blair, and E. T. Craswell., Canberra.

Swift, M.J., Heal, O.W., and Anderson, J.M. (1979) Decomposition in Terrestrial Ecosystems. University of California Press, Berkeley

Swift, R.S. (1991) Effects of humic substances and polysaccharides on soil aggregation. Advances in Soil Organic Matter Research : The Impact on Agriculture & the Environment., 3-4 September 1990. pp. 153-162. Eds. W. S. Wilson. The Royal Society of Chemistry, Cambridge.

Syers, J.K., and Craswell, E.T. (1995) Role of soil organic matter in sustainable agricultural systems. Soil Organic Matter Management for Sustainable Agriculture, ACIAR Proceedings No. 56. Ubonratchathani, Thailand, 24-26 August 1994. pp. 7-14. Eds. R. D. B. Lefroy, G. J. Blair, and E. T. Craswell., Canberra.

Ta, T.C., and Faris, M.A. (1990) Availability of N from ^{15}N-labelled Alfalfa residues to three succeeding barley crops under field conditions. *Soil Biology and Biochemistry.* **22**, 835- 838.

Takahashi, J. (1978) Role of nightsoil in Japanese agriculture. *FAO Soil Bulletin.* **36**, 363-364.

Tanaka, A. (1978) Role of organic matter. In 'Soils and Rice.' Ed. International Rice Research Institute International Rice Research Institute, P.O. Box 933, Manila, Philippines pp. 605-622.

Taylor, B.R., Parkinson, D., and Parson, W.F.J. (1989) Nitrogen and lignin content as predictors of litter decay rates: A microcosms test. *Ecology.* **70**, 97-104.

Technicon (1977) Nitrate and Nitrite in Soil Extracts. Industrial Method No. 487-77A

Tenney, F.G., and Waksman, S.A. (1929) Composition of natural organic materials and their decomposition. IV. The nature and rapidity of decomposition of the various organic complexes in different plant materials, under aerobic conditions. *Soil Science.* **28**, 55-84.

Theng, B.K.G., Tate, K.R., and Sollins, P. (1989) Constituents of organic matter in temperate and tropical soils. In 'Dynamics of Soil Organic Matter in Tropical Ecosystems.' Ed. D.C. Coleman, J.M. Oades, and G. Uehara University of Hawaii Press, Honolulu pp. 5-32.

Thomas, R.J., and Asakawa, N.M. (1993) Decomposition of leaf litter from tropical forage grasses and legumes. *Soil Biology and Biochemistry.* **25**, 1351-1361.

Tian, G., Brussaard, L., and Kang, B.T. (1993) Biological effects of plant residues with contrasting chemical compositions under humid tropical conditions - Effects on soil fauna. *Soil Biology and Biochemistry.* **25**, 731-737.

Tian, G., Brussaard, L., and Kang, B.T. (1995a) Breakdown of plant residues with contrasting chemical compositions under humid tropical conditions: Effects of earthworms and millipedes. *Soil Biology & Biochemistry.* **27**, 277-280.

Tian, G., Brussaard, L., and Kang, B.T. (1995b) An index for assessing the quality of plant residues and evaluating their effects on soil and crop in the (sub-)humid tropics. *Applied Soil Ecology.* **2**, 25-32.

Tian, G., Kang, B.T., and Brussaard, L. (1992a) Biological effects of plant residues with contrasting chemical compositions under humid tropical conditions - Decomposition and nutrient release. *Soil Biology and Biochemistry.* **24**, 1051-1060.

Tian, G., Kang, B.T., and Brussaard, L. (1992b) Effects of chemical composition on N, Ca and Mg release during incubation of leaves from selected agroforestry and fallow species. *Biogeochemistry.* **16**, 103-119.

Tiessen, H., Karamanos, R.E., Stewart, J.W.B., and Selles, F. (1984) Natural nitrogen 15 abundance as an indicator of soil organic matter transformations in native and cultivated soils. *Soil Science Society of America Journal.* **48**, 312-315.

Tiessen, H., Salcedo, I.H., and Sampaio, E.V.S.B. (1992) Nutrient and soil organic matter dynamics under shifting cultivation in semi-arid Northeastern Brazil. *Agriculture, Ecosystems & Environment.* **38**, 139-151.

Till, A.R., McArthur, G.S., and Rocks, R.L. (1984) An automated procedure for the simultaneous determinations of sulfur and phosphorus and of radio activity in biological samples. Proceedings of Sulfur-84 Calgary, Alberta, Canada, 3-6 June 1984. pp. 649-660. Sulfur Development Institute of Canada (SUDIC), Calgary, Canada.

Toomsan, B., Limpinuntana, V., Homchan, J., Sunarlim, N., McDonagh, J.F., and Giller, K.E. (1993) Residual effects of grain legumes on followings crops in North-eastern Thailand. Soil Organic Matter Dynamics and Sustainability of Tropical Agriculture Leuven, Belgium, 4-6 November 1991. pp 361-366. Eds. K. Mulongoy and R. Merckx. John Wiley & Sons, Baffins Lane, Chichester.

Unger, P.W., and McCalla, T.M. (1980) Conservation tillage systems. *Advances in Agronomy.* **33**, 2-53.

Upadhyay, V.P., and Singh, J.S. (1989) Patterns of nutrient immobilization and release in decomposing forest litter in Central Himalaya, India. *Journal of Ecology.* **77**, 127-146.

Vallis, I., and Jones, R.J. (1973) Net mineralization of nitrogen in leaves and leaf litter *of Desmodium intortum* and *Phaseolus atropurpureus* mixed with soil. *Soil Biology and Biochemistry.* **5**, 391-398.

Van den Beldt, R.J., and Huxley, P. (1982) Institutions studying nitrogen fixing trees. NFTA Miscellaneous Publication 82-06., Waimanalo, Hawaii, U.S.A., Eds. Nitrogen Fixing Tree Association.

van der Pol, F., and Traore, B. (1993) Soil nutrient depletion by agricultural production in Southern Mali. *Fertilizer Research.* **36**, 79-90.

Van Gestel, M., Merckx, R., and Vlassak, K. (1993) Soil drying and rewetting and the turnover of ^{14}C-labelled plant residues: First order decay rates of biomass and non-biomass ^{14}C. *Soil Biology and Biochemistry.* **25**, 125-134.

Van Soest, P.J. (1963) Use of detergents in the analysis of fibrous feeds. II. A rapid method for the determination of fiber and lignin. *Journal of the Association of Official Agricultural Chemists.* **46**, 829-835.

Vanlauwe, B., Vanlangenhove, G., Merckx, R., and Vlassak, K. (1995) Impact of rainfall regime on the decomposition of leaf litter with contrasting quality under subhumid tropical conditions. *Biology and Fertility of Soils.* **20**, 8-16.

Vaughan, D., Sparling, G.P., and Ord, B.G. (1983) Amelioration of the phytotoxicity of phenolic acids by some soil microbes. *Soil Biology and Biochemistry.* **5**, 613-614.

Veldkamp, E., and Weitz, A.M. (1994) Uncertainty analysis of delta ^{13}C method in soil organic matter studies. *Soil Biology and Biochemistry.* **26**, 153-160.

Vigil, M.F., and Kissel, D.E. (1995) Rate of nitrogen mineralized from incorporated crop residues as influenced by temperature. *Soil Science Society of America Journal.* **59**, 1636- 1644.

Waksman, S.A., and Tenney, F.G. (1927) Composition of natural organic materials and their decomposition in the soil. II. The influence of age of plant upon the rapidity and nature of its decomposition - Rye plants. *Soil Science.* **24**, 317-333.

Walkley, A. (1947) A critical examination of a rapid method for determining of organic carbon: Effects of variations in digestion conditions and inorganic soil constituents. *Soil Science.* **63**, 251-263.

Walkley, A., and Black, I.A. (1934) An examination of the Degtjareff method for determining of soil organic matter and a proposed modification of the chromic acid titration method. *Soil Science.* **37**, 29-38.

Wallace, A. (1994a) Soil improvement to match 21st century agriculture. *Communications in Soil Science and Plant Analysis.* **25**, 165-169.

Wallace, A. (1994b) Soil organic matter is essential to solving soil and environmental problems. *Communications in Soil Science and Plant Analysis.* **25**, 15-28.

Wallace, A. (1994c) Soil organic matter must be restored to near original levels. *Communications in Soil Science and Plant Analysis.* **25**, 29-35.

Walters, D.T., Aulakh, M.S., and Doran, J.W. (1992) Effects of soil aeration, legume residue and soil texture on transformations of macro- and micronutrients in soils. *Soil Science.* **153**, 100-107.

White, P.F. (1990) The influence of alternative tillage systems on the distribution of nutrients and organic carbon in some common Western Australian wheatbelts soils. *Australian Journal of Soil Research.* **28**, 95-116.

White, P.J. (1984) Effects of crop residue incorporation on soil properties and growth of subsequent crops. *Australian Journal of Experimental Agriculture.* **24**, 219-235.

White, R.E. (1979) Introduction to the Principles and Practice of Soil Science. Chapter 3 and Section 10.2. Oxford, Blackwell

White, R.E., and Ayoub, A.T. (1983) Decomposition of plant residues of variable C/P ratio and the effect on phosphate availability. *Plant and Soil.* **74**, 164-173.

Whiteley, G.M., and Pettit, C. (1994) Effect of lignite humic acid treatment on the rate of decomposition of wheat straw. *Biology and Fertility of Soils.* **17**, 18-20.

Wieder, R., and Lang, G. (1982) A critique of the analytical methods used in examining decomposition data obtained from litter bags. *Ecology.* **63**, 1636-1642.

Wilhelmi, V., and Rothe, G.M. (1990) The effect of acid rain, soil temperature and humidity on C mineralization rates in organic soil layers under spruce. *Plant and Soil.* **121**, 197-202.

Willett, I.R. (1995) Role of organic matter in controlling chemical properties and fertility of sandy soils used for lowland rice in Northeast Thailand. Soil Organic Matter Management for Sustainable Agriculture, ACIAR Proceedings No. 56. Ubonratchathani, Thailand, 24-26 August 1994. pp. 109-114. Eds. R. D. B. Lefroy, G. J. Blair, and E. T. Craswell., Canberra.

Witkamp, M., and Ausmus, B.S. (1976) Processes in decomposition and nutrient transfer in forest ecosystems. In 'The Role of Terrestrial and Aquatic Organisms in Decomposition Processes.' Ed. J.M. Anderson, and A. Macfadyen Blackwell Scientific, Oxford pp. 375-396.

Wonprasaid, S., Naklang, K., Khonthasuvon, S., Mepetch, S., Hemthanon, B., Tippayaruk, S., and Lefroy, R. (1995) Organic matter residue management in lowland rice in Northeast Thailand. Soil Organic Matter Management for Sustainable Agriculture, ACIAR Proceedings No. 56. Ubonratchathani, Thailand, 24-26 August 1994. pp. 98-103. Eds. R. D. B. Lefroy, G. J. Blair, and E. T. Craswell., Canberra.

Wood, A.W. (1985) The stability and performance of Huli agriculture . In 'Occasional Paper No 5 (new series).' Ed. University of Papua New Guinea and the Southern Highlands Rural Development Project Department of Geography.

Wood, C.W., Westfall, D.G., Peterson, G.A., and Burke, I.C. (1990) Impacts of cropping intensity on carbon and nitrogen mineralization under no-till dryland agroecosystems. *Agronomy Journal.* **82**, 1115-1120.

World Resources Institute (1992) World Resources 1992-93. Oxford University Press, New York, Oxford

Wu, J., O'Donnell, A.G., and Syers, J.K. (1993) Microbial growth and sulphur immobilization following the incorporation of plant residues into soil. *Soil Biology and Biochemistry.* **25**, 1567-1573.

Yaacob, O., and Blair, G.J. (1980) Mineralization of ^{15}N- labelled legume residues in soils with different nitrogen contents and its uptake by Rhodes grass. *Plant and Soil.* **57**, 237- 248.

Yamamoto, S., and Teramoto, T. (1978) Present status of organic fertilizers in Japan. *FAO Soil Bulletin.* **36**, 387-393.

Yuan, C. (1984) The utilization of animal and human wastes in rice production in China. In 'Organic Matter and Rice.' Ed. International Rice Research Institute, Los Banos, Laguna, Philippines pp. 179-192.

Zhu, Z., Liu, C., and Jiang, B. (1984) Mineralization of organic nitrogen, phosphorus, and sulfur in some paddy soils of China. In 'Organic Matter and Rice.' Ed. International Rice Research Institute, Los Banos, Laguna, Philippines pp. 259-272.

APPENDICES

Appendix 4.1 : Result of analysis of variance performed by NEVA computer program

```
FILE APPA2.OUT  CREATED BY NEVA VERSION  4.3
                            ON    9/ 3/88 AT 12H 34M
 #    1  NEVA APPARENT RECOVERY OF 2ND CROP (3 & 15 T/HA)
 #    2  FACTORS R3 S5 A2

    **        3 FACTORS
    **       30 ITEMS
 #    3  EFFECTS R S A SA RSA/
 #    4  C P
 #    5  DATA
 #    6  -21.73  -45.55  20.16
 #    7  508.64  512.65  488.88
 #    8  166.30  102.21  122.56
 #    9  80.11   87.39   186.13
 #   10  326.81  209.49  443.51
 #   11  11.32   -10.59  21.56
 #   12  93.30   33.63   60.92
 #   13  4.53    41.43   42.96
 #   14  39.03   38.65   54.16
 #   15  119.40  50.48   158.37
 #   16  END

 SOURCE                DF        SUM OF SQUARES          MEAN SQUARE        F        PROB

 GRAND MEAN             1        519217.300000        519217.300000   295.1235  0.00000***
 R                      2         16808.470000          8404.233000     4.7770  0.02167*
 S                      4        324279.500000         81069.870000    46.0802  0.00000***
 A                      1        196572.500000        196572.500000   111.7320  0.00000***
 SA                     4        189821.500000         47455.370000    26.9737  0.00000***
 RSA/                  18         31667.800000          1759.322000

 SD OF MEANS BASED ON PLOT ERROR      41.[illegible]44270    DF=  18

 GRAND MEAN       MEANS OF   30. SD=    [illegible].6579        5PC LSD=   22.7711        1PC LSD=
31.1753

             131.5570

 R                MEANS OF   10. SD=   13.2639        5PC LSD=   39.4407        1PC LSD=
53.9972

               R 1       R 2       R 3
             132.7710 101.9790 159.9210

         2            3
 5PC DUNCANS MULTIPLE RANGE
      39.4093      41.3497

 S                MEANS OF   [illegible] SD=   17.1237        5PC LSD=   50.9178        1PC LSD=
69.7101

               S 1       S [illegible]       S [illegible]       S 4       S 5
             -4.1383 283.0033  [illegible]  80.9117 218.0100

  SORTED MEANS
      -4.1383      79.9983      80.9117     218.0100     283.0033

         2            3            4            5
 5PC DUNCANS MULTIPLE RANGE
      50.8771      53.3822      54.9680      56.0639

 A                MEANS OF   15. SD=   10.8300        5PC LSD=   32.2032        1PC LSD=
44.0885

               A 1       A [illegible]
             212.504   [illegible]

 SA               MEANS OF   [illegible]        5PC LSD=   [illegible]        1PC LSD=
98.5850
```

```
              S 1       S 2       S 3       S 4       S 5
      A1    -15.7067 503.3900 130.3567 117.8767 326.6033
      A2      7.4300  62.6167  29.6400  43.9467 109.4167

  SORTED MEANS
     -15.7067      7.4300      29.6400      43.9467      62.6167     109.4167     117.8767
130.3567     326.6033     503.3900

         2            3            4            5            6            7            8            9
10
 5PC DUNCANS MULTIPLE RANGE
      71.9511      75.4939      77.7373      79.2863      80.4160      81.2693      81.9286
82.4457      82.8546


 #  200  STOP

 END OF NEVA JOB
     200 LINES INPUTTED
    1227 LINES OUTPUTTED
```

Appendix 5.1 : Nutrient solution of residue plants per one application

Compounds	M.W. (g)	Nutrient	Compound (g/L)	Nutrient (kg/ha)
Macronutrients				
$Ca(NO_3)_2.4H_2O$	236.1	N	7.083	9.692
		Ca		13.881
KNO_3	101.1	K	2.022	9.023
		N		3.231
$NH_4H_2PO_4$	115.0	P	2.3	7.154
		N		2.231
$MgSO_4.7H_2O$	246.4	Mg	1.848	2.103
		S		2.778
KCl	74.5	K	1.49	9.023
Micronutrients				
FeNaEDTA	367.1	Fe	0.55065	0.966
$MnCl_2.4H_2O$	197.9	Mn	0.2969	0.095
$ZnCl_2$	136.2	Zn	0.00204	0.011
$CuCl_2$	134.4	Cu	0.00134	0.0073
H_3BO_3	61.8	B	0.00031	0.00063
$(NH_4)_6Mo_7O_{24}.4H_2O$	1235.3	Mo	0.00012	0.00011

Appendix 5.2 : Result of analysis of variance and mean comparisons performed by IRRISTAT computer program

FILENAME : 15N-PT
TITLE : 15N IN JAPANESE MILLET

A N A L Y S I S O F V A R I A N C E

SPLIT PLOT DESIGN

REPLICATION (R) = 3

MAINPLOT FACTOR : HARVEST (H) = 3
H1 = 27D
H2 = 48D
H3 = 91D

SUBPLOT FACTOR : 2 x 3

FERTILISER (F) = 2
F1 = LOW
F2 = HIGH

RESIDUE (M) = 3
M1 = FLEMINGIA
M2 = MEDIC
M3 = WHEAT

15N IN MILLET (% OF ADDED)

			REP1	REP2	REP3
H1	F1	M1	0.496	0.187	0.235
		M2	2.296	1.130	1.049
		M3	1.033	0.858	0.575
	F2	M1	0.574	0.574	0.727
		M2	1.877	3.105	1.520
		M3	1.889	1.686	0.672
H2	F1	M1	2.106	3.091	3.779
		M2	17.594	11.396	12.501
		M3	7.650	4.142	4.356
	F2	M1	3.143	3.141	3.851
		M2	9.359	9.618	8.081
		M3	4.896	4.143	4.021
H3	F1	M1	2.727	3.509	5.233
		M2	20.238	15.092	14.630
		M3	6.223	9.627	5.912
	F2	M1	5.349	5.120	5.326
		M2	13.152	15.508	16.053
		M3	7.013	12.792	16.935
REP TOTALS			107.527	104.919	105.456
REP MEANS			5.974	5.829	5.859

ANALYSIS OF VARIANCE FOR 15N IN MILLET (% OF ADDED)

SV	DF	SS	MS	F
REP (R)	2	0.210724	0.105362	-
HARVEST (H)	2	723.183698	361.591849	-
ERROR (a)	4	17.325127	4.331282	
FERTILISER (F)	1	0.102095	0.102095	<1
RESIDUE (M)	2	444.356526	222.178263	63.21 **
FxM	2	29.425485	14.712742	4.19 *
HxF	2	26.746967	13.373483	3.80 *
HxM	4	167.774812	41.943703	11.93 **
HxFxM	4	25.789807	6.447452	1.83 ns
ERROR (b)	30	105.452761	3.515092	
TOTAL	53	1540.368002		

cv(b) = 31.8%
** = significant at 1% level; * = significant at 5% level
ns = not significant; - = insufficient error df

HxFxM TABLE OF MEANS FOR 15N IN MILLET (% OF ADDED)
(AVE. OVER 3 REPS)

RESIDUE (M)	FERTILISER (F) LOW	FERTILISER (F) HIGH	M-MEAN	DIFF
H=27D				
FLEMINGIA	0.306 a	0.625 a	0.466	-0.319 ns
MEDIC	1.462 a	2.167 a	1.815	-0.705 ns
WHEAT	0.822 a	1.416 a	1.119	-0.594 ns
H=48D				
FLEMINGIA	2.992 b	3.378 b	3.185	-0.386 ns
MEDIC	13.830 a	9.019 a	11.425	4.811 **
WHEAT	5.383 b	4.353 b	4.868	1.029 ns
H=91D				
FLEMINGIA	3.823 c	5.265 b	4.544	-1.442 ns
MEDIC	16.653 a	14.904 a	15.779	1.749 ns
WHEAT	7.321 b	12.247 a	9.784	-4.926 **
F-MEAN	5.844	5.931	5.887	-0.087

** = significant at 1% level, ns = not significant

In a column under each H, means followed by a common letter are not significantly different at the 5% level by DMRT.

Comparison	S.E.D.	LSD(5%)	LSD(1%)
2-F means at each H*M	1.531	3.126	4.210
2-M means at each H*F	1.531	3.126	4.210

HxM TABLE OF MEANS FOR 15N IN MILLET (% OF ADDED)
(AVE. OVER 2 F AND 3 REPS)

RESIDUE (M)	HARVEST (H) 27D	48D	91D	M-MEAN
FLEMINGIA	0.466 a	3.185 b	4.544 c	2.732
MEDIC	1.815 a	11.425 a	15.779 a	9.673
WHEAT	1.119 a	4.868 b	9.784 b	5.257
H-MEAN	1.133	6.493	10.036	5.887

In a column, means followed by a common letter are not significantly different at the 5% level by DMRT.

Comparison	S.E.D.	LSD(5%)	LSD(1%)
2-M means at each H	1.082	2.211	2.977

HxF TABLE OF MEANS FOR 15N IN MILLET (% OF ADDED)
(AVE. OVER 3 M AND 3 REPS)

HARVEST (H)	FERTILISER (F) LOW	HIGH	H-MEAN	DIFF
27D	0.863	1.403	1.133	-0.539 ns
48D	7.402	5.584	6.493	1.818 *
91D	9.266	10.805	10.036	-1.540 ns
F-MEAN	5.844	5.931	5.887	-0.087

* = significant at 5% level, ns = not significant

Comparison	S.E.D.	LSD(5%)	LSD(1%)
2-F means at each H	0.884	1.805	2.431

FxM TABLE OF MEANS FOR 15N IN MILLET (% OF ADDED)
(AVE. OVER 3 H AND 3 REPS)

RESIDUE (M)	FERTILISER (F) LOW	HIGH	M-MEAN	DIFF
FLEMINGIA	2.374 c	3.089 c	2.732	-0.716 ns
MEDIC	10.649 a	8.697 a	9.673	1.952 *
WHEAT	4.508 c	6.005 b	5.257	-1.497 ns
F-MEAN	5.844	5.931	5.887	-0.087

* = significant at 5% level, ns = not significant
In a column, means followed by a common letter are not significantly different at the 5% level by DMRT.

Comparison	S.E.D.	LSD(5%)	LSD(1%)
2-F means at each M	0.884	1.805	2.431
2-M means at each F	0.884	1.805	2.431

*** END OF ANALYSIS OF VARIANCE RUN ***