

## 〔講演要旨〕

## Effects of Different Composts and Green Manures of Pea (*Pisum sativum* L.) Residue on Wheat Growth

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Pea (*Pisum sativum* L.), a legume is cultivated as a vegetable or pulse and its residue could be a good source of plant nutrients. Wheat is the world's number one food grain of which nutrient management should be prioritized. Chicken manure and rapeseed oil (*Brassica napus* L. and *B. rapa* L.) residue are agro industrial wastes having high plant nutrients. In Bangladesh most of the farmers grow high yielding varieties of wheat and rice with huge chemical fertilizers. Some farmers grow pea and get financial benefits, but they either burn or directly mix pea residue with soil. If peas are cultivated for young pods and used residue as compost then it gives income and saves chemical fertilizers. So, pea plants were used for the increment of soil fertility with chicken manure and rapeseed residue targeting sustainable soil fertility and recycle of wastes. Green house experiments were conducted during 2004-2006 to find out the impacts of pea compost and green manure on wheat growth and to find out the suitable material to enrich pea residue at Gifu University. Dried chicken manure and or rape oil residue were mixed with pea plants after pod harvest and kept them in pots for compost preparation or mixed with soil directly as green manure. Results revealed that there were significant effects of

compost and green manure on nutrient supply and yield of wheat. Composts of pea debris with dried chicken manure plus rape oil residue augmented the highest position in almost all parameters and gave higher yield. After mixing of that compost with soil, it enriched soil by supplying higher nutrients; like total N (0.28%), total C (1.88%), available P (0.176 g kg<sup>-1</sup>), exchangeable K (24.9 mg 100<sup>-1</sup> g), Ca (154.85 mg 100<sup>-1</sup> g) and Mg (49.8 mg 100<sup>-1</sup> g) and showed good germination rate and index. Microbial activity was also higher in the soil, higher fungal (62219 cfu g<sup>-1</sup> dw) and bacterial (35.92 E6 cfu g<sup>-1</sup> dw) population was monitored in the same treatment. Wheat plants can uptake higher nutrients from pea compost along with dried chicken manure and rapeseed oil residue enriched soil. Relatively higher N (2.89%), K (2292 mg100<sup>-1</sup> g), Ca (447.5 mg100<sup>-1</sup> g), Mg (428 mg100<sup>-1</sup> g) concentration in shoot, higher number of tiller (15.1/plant), number of spike (24.1/plant) and spikelet (18.04/spike), dry matter (13.21g/plant) and grain yield (66.1 g/pot) of wheat were observed in the same compost added soil. More over, compost treatments were found better than green manure of any combination in almost all parameters.

## 〔講演要旨〕

## Effects of Carbonized Chicken Manure Supply on the Growth of Grain Legumes

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With the boom in poultry production all over the world, there has been mounting waste in the form of poultry manures. The management and disposal of these manures are of great importance because of health and environmental concerns. Direct application of raw poultry manures to cropland may cause pollution and also difficult because of the volume, weight and offensive smell of the material creating problems with transportation, handling, storage and application. Most of these problems can be obviated through carbonization. Carbonized poultry manure contains high levels of P which can therefore be used as suitable soil amendment material for nodulating grain legumes. The objectives of this study are to investigate the effects of carbonized chicken manure supply on 1) the growth, yield and nodulation of four grain legumes 2) evaluate the effects of carbonized chicken manure supply on the total N and total P of plants and seeds 3) assess the

effects of carbonized chicken manure application on some chemical characteristics of the experimental soil. A pot experiment comprising 2 rates of carbonized chicken manure (0 kg N/ha and 100 kg N/ha) x 4 grain legumes (Soybean, Cowpea, Common bean and Adzuki bean) factorial arrangement in randomized complete block design with six replications was conducted from May, 2006 at the polyvinyl house, Gifu University. Data available indicate that the supply of carbonized chicken manure increased the plant height and relative chlorophyll content (SPAD) of all four grain legumes. Root dry weight of soybean, cowpea and common bean were increased by the application of carbonized chicken manure. Total dry matter yield of soybean and cowpea increased with carbonized chicken manure supply. Number of nodules and nodule dry weight of soybean and cowpea improved with the supply of the manure