Effects of Chinese milk vetch (*Astragalus sinicus* L.) as a Winter Cover Crop on Reducing Weeds and Changes in Soil Nutrients in No-till Paddy Soil

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1. Objectives

To investigate characteristics of Chinese milk vetch and its effects on weed control and soil nutrients in no-till paddy condition

2. Materials and methods

Two field experiments were carried out in silt loam and clay loam soils. Percentages of seed germination and over-wintering of vetch seedlings of Chinese milk vetch introduced to no-till paddy system were investigated in 15-day intervals from August 30. In order to preserve seed position, plastic pots, sized 1/2,000a, were buried in the soil.

Tab 1. Sites and soil chemical properties of soils (1996)

Sites	Tillage	pH (1:5)	EC (1:5)	Av.P_2O_5 (mg/kg)	Ca (cmol+ /kg)	K (cmol+/kg)	Mg (cmol+/kg)	OM (%)
Uae-ryeong	No-till	5.0	0.45	115	6.4	0.48	1.28	2.4
	Till	5.1	5.1	100	5.6	0.43	1.16	1.8
Sacheon	No-till	5.7	0.21	55	8.9	0.82	1.91	1.7
	Till	5.8	0.22	70	7.4	0.79	1.73	1.6

Determination of plant growth and measurements:

1) Flowering stage : Over 50% of the heads have flowered.
2) Plant height and root length : five replications each sized 0.1m^2.
3) Nitrogen content(%) : Kjeldahl method with Kjletec Analysis Sistem 2000.
4) Plant density : Chinese milk vetch and weeds per 0.1m^2 with 10 replications in 30-day interval.

3. Results and discussion

1. Milk vetch's density has slowly decreased as the growth stage progressed. With milk vetch, for foxtails and other weeds were significantly decreased.
2. Weed controlling effects were observed Plant height increasing by the fresh covering of the whole field. In Contrary to plant height root length did not increased after March 1 (Fig. 1.).
3. Vetch seeds harvested by May 23, should indrease germination percent and thus it was expected to maintain vetch population in successive years. The Plant height of the of vetch was increased to ripening stages, however, the root length of the

vetch was terminated by early march.

4. In order to keep high level of wintering percent, the vetch was to be sown by late September.
5. Nitrogen content of vetch herbage has decreased from flowering (2.9%) to ripening stage (1.7%) in 30 days, (Fig. 4.)

Tab. 2. The percentage of germination and overwintering by the different seeding time under paddy rice cropping system(100 seeds/ 0.1m^2)

	August 30	September 15	September 30	November 15
Germination (%)	95±2.8	92±2.3	83±4.5	53±6.5
Overwintering(%)	65±4.6	58±5.2	23±3.8	3±1.5

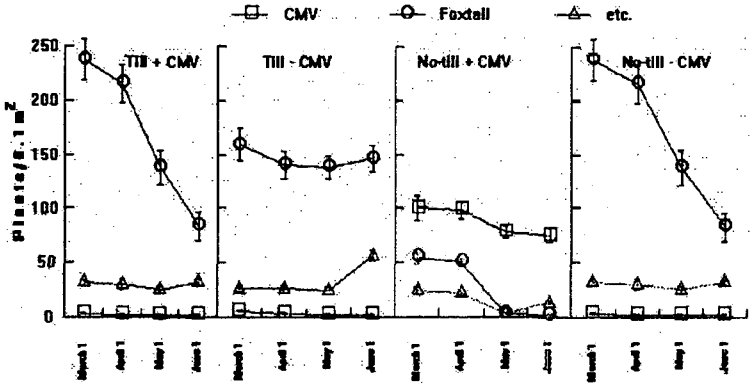

Fig. 1. Changes of plant density by the tillage and no-tillage with Chinese milkvetch and without Chinese milkvetch

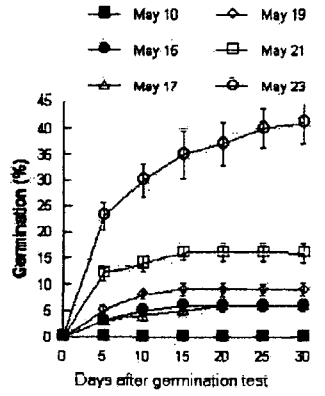

Fig. 3. Changes of Chinese milkvetch germination(%) by the harvesting time in Sacheon in 1996.

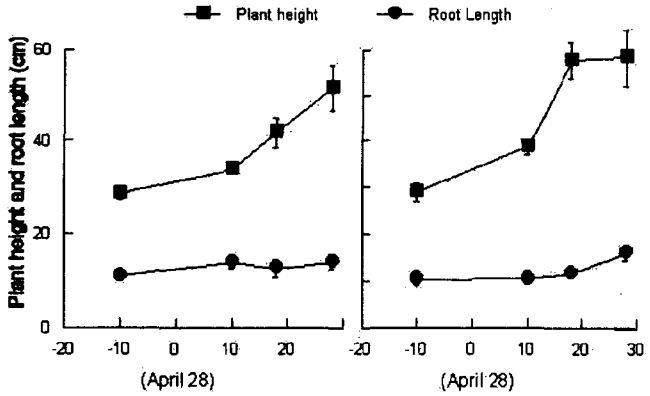

Fig. 2. Changes of Chinese milk vetch plant height and root length(cm) by the time increasing in paddy field.

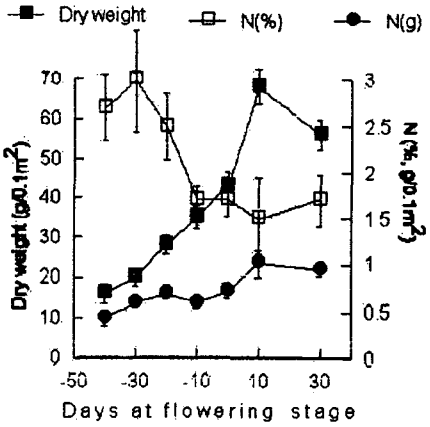

Fig. 4. Changes of Chinese milkvetch dry weight, N content(%, and g/0.1m^2) in paddy field.