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EFFECT OF IRON FERTILIZER AND METHANOL SPRAYING ON THE SOYBEAN YIELD

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ABSTRACT

A project was done at Lahidjan city (Iran north province) on 2013 to survey the effects methanol and iron on the soybean yield. The project was composed by factorial test into randomized complete blocks design together three replications. Primary factor was methanol at five levels such 0, 10, 20, 30 and 40 volume percent and second factor was iron chelat consumption with three levels such 0, 0.5, 1 cc/lit. results indicated that methanol spraying has significant effect on the soybean yield at 0.01 level and maximum and minimum yield was gathered by treatments 20 and 40 methanol volume percent equally 3313 and 2142 kg/ha respectively. Iron has significant effect on soybean at 0.01 level that maximum and minimum yield were 2917 and 2482 kg/ha and they were gathered by treatments such iron 1/1000 and iron control respectively.

Keyword: *Methanol Spraying, Iron, Soybean, Yield*

INTRODUCTION

Increasing yield is a main aim that is very important for agricultural researchers. Photosynthesis is a main process to make organic matter at plants. Production dry matter rate has direct correlation to photosynthesis random rate and biostabilization mode of carbon dioxide at cultural plants. Today, most results indicate that using from simple alcohols such methanol causes to increase density of CO₂ and totally increasing production and yield in three carbonic cultural plants (Ramirez *et al.*, 2006) and decreasing induced stress cause to blocking respiration photo (Nonomura and Benson, 1992). In generally, methanol spraying can decrease respiratory photo rate according to the 25% of plant carbon is consumed to photo respiratory and the reason of the process, this is that methanol speedily was metabolized to CO₂ and water in plant tissues (Gout *et al.*, 2000). Methanol chemisterical isomerilly is smaller than co₂ molecule, so it can absorb easily at three carbonic plants to increase photosynthesis (Aslani *et al.*, 2011). Survey and more research for using methanol are essential due to benefic effects. Mirakhori *et al.*, (2000b) express that methanol spraying causes to increase yield Seed, height plant, filling numeric sheaths, leaf area and total biomass plant. Their results indicate that methanol treatments such density 14 and 21 volume percent cause to increase yield 16.8% and 40.2% respectively. The project was subjected to survey effects methanol spraying and iron on the soybean yield.

MATERIALS AND METHODS

The project was done at Lahidjan city at 2013. The project was composed by factorial test and randomized complete block designs by three replications. First factor was methanol by five levels such 0, 10, 20, 30, 40 volume percent and second factor was iron chelat by three levels such 0, 0.5, 1 cc/lit. 2 gr/lit glycine and 1 mg/lit tetrahydrofolpet were added to each methanol treatments. 1 ml/lit Tween 80 was added to methanol solutions to increase adherence of solutions as for as surfactant. The project was done on plots such 2.5*5 m diametrically. Plots of per replication have distance equally 0.5 m and 1 m of replications together. Soybean was planted on flatted farm and condition and no irrigation. Seeds infected by carboxin-thiram 1/1000 pre-planting and then were planted at soil by hand at four centimeter deeply. Distance of two rows soybean and too, two bushes soybean on per row together are 40 centimeter methanol spraying was done twice at growing season that have distance time equal 10 day together. First spraying was done on the bushes initial sheathing and bushes were sprayed at 17 and 19 o'clock. Spraying process was done pumping toxin spreader by equal pressure on the soybean bushes. Spraying process

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were continued until to pour of articles of toxins from soybean's leaves. Distance between sprayllier nazol and bushes were 50 centimeter. Marginal and initial and end bushes were eliminated to sampling accuracy. Considerable characters were composed such seed yield on the surface and number Seed per m² and number sheath at bushes and height bushes and weight 100 seeds. MSTAT-C software was used to analyze data to compare averages. Average comparison was done by Duncan's multiparameter test at 0.05 levels.

RESULTS AND DISCUSSION

Variation analysis results (Table 1) indicate that methanol spraying has significant effect on the number of seeds per m² and number of pods per plant and plant height and 100-seeds weight. Most averages were gathered by treatments 20, 30 percent volume of methanol. Iron has significant effect on the number of seeds per m² and number of pods per plant at 0.01 levels (Table 1) that treatments' iron 1/1000 has most averages of yield's components. Interaction between iron with methanol has significant effect on the number of seeds per m², number of pods per plant and plant height and 100-seeds weight at 0.01 level (Table 1) that generally most averages were shown at treatments such methanol 30 percent volume and iron chelat 1/1000. Variation analysis results indicate that methanol spraying has significant effect on soybean seed yield at 0.01 level (Table 1) that maximum and minimum are 3313 and 2142 kg/hi.

That is gathered by methanol 20 percent volume and 40 percent volume respectively. Jafari Paskiabi *et al.*, (2011) were showed that most yield cow bean was gathered by methanol 30 percent volume. Aslani *et al.*, (2011) expressed that methanol 20 percent volume had most effect on the mungobean Seed yield. Mirakhori *et al.*, (2010 a) reported that methanol spraying has significant effect on the red bean Seed yield that the results was gathered most yield was indicated by 25 percent volume methanol. Mirakhori *et al.*, (2010 b) explained that most yield of soybean was gathered by spraying of Li *et al.*, (1995) increase yield Seeds soybean that treatment by methanol and these have significant difference with control treatment. Safarzadeh Vishkaii (2007) and Ramirez *et al.*, (2006), Zbiec *et al.*, (2003) gathered similar results. Iron chelat has significant effect on the soybean seed yield at 0.01 level (Table 1) that maximum and minimum averages was being 2917 and 2482 kg/hi respectively that gathered by treatments such as iron 1/1000 and control treatment.

Table 1: Results of ANOVA for methanol solution concentration and iron on yield and yield components of soybean

Source of change	df	Mean-square				
		Seed Yield	Number of Seeds	Number of Pods	Plant height	100-Seed weight
Replication	2	187564.44	123.64	3.04	2.21	0.33
Methanol	4	4874637.24**	4837.53**	386.25**	165.44**	11.54**
Iron	2	876533.13**	4873.23**	55.43**	0.13 ^{ns}	0.63 ^{ns}
Interaction	8	274832.37 ^{ns}	263.33 ^{ns}	2.65 **	15.21**	0.43**
Error	28	156248.95	56.45	0.36	1.43	0.33
Coefficient of Variation (%)		9.31	3.43	3.54	1.13	

ns, **, *: the difference is meaningless, statistically significant at 1% and 5%

Results

The results in our project indicate that methanol spraying and iron chelat have significant effects on the all of measuring characters. Most yields are gathered by treatments methanol 20 percent volume and iron chelat 1/1000. Methanol increases plant growth due to it is carbon source and increase plant photosynthesis efficiency. Today, fertilizers such N, K, P and recently is considered by microelements such Fe, Zn, Cu but not allover could increase absorptive carbon at plant tissues. So, methanol can affect on the cultural plant's growth and yield by title increasing factor for absorption carbon and photosynthesis efficiency.

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