Gomal Univ.J.Res. Vol.17: pp 11-16, 1997 [Printed in Dec. 1999] ISSN 1019-8180

AMENDMENT OF HIGH SOIL pH BY SULPHER AND ALUMINIUM SULPHATE.

F.S.HAMID, N.AHMAD AND A.WAHEED

* National Tea Research Station, Shinkiari, Mansehra.

ABSTRACT

Field studies were conducted at National Tea Research Shinkiari, District Mansehra on soil amendment with sulpher and aluminium sulphate during 1992 and 1993.Two levels each of sulpher (115 & 225 gms/pit) and aluminium sulphate (450 & 880 gms/pit) were applied in the pits. The soil pH before treatment was rangingfrom 5.53 to 5.95, 5.88 to 5.96 and 6.23 to 6.43 at 0-15, 15-30and 30-45cm depth respectively. The highest decrease in the soil pH (3.63 & 3.74) was recorded in soil treated by 225 gms of sulpher causing the highest mortality of tea saplings of 71.0 and 76.0 percent during 1992 and 1993 respectively. On the other hand the pH was brought to optimum level around 5.0 by the application of 880 gms of aluminium sulphate. This showed the lowest mortality of tea saplings as compered to other treatments including control. The other parameters under study i.e wt. of pruned material , number of branches, height of the tea saplings, weight of fresh & dry roots were also improved by the application of aluminium sulphate both @ 450 & 880 gms/pit.

INTRODUCTION

Tea as a commercial commodity is the product of the plant Camellia sinensis, wich is grown in a wide range of soil types found in tropical, sub-tropical and temperate climatic conditions [7, 3, 5, 4]. Besides temperature and precipitation the common limiting factor is the soil acidity as tea plant thrives best in acidic soils.The optimal range of soil pH is 5.0 to 5.6 wich varies with the nature of the soil, particularly the organic matter contents. Willson [10] stated that soils of the pH 5.6 and above are always considered unsuitable for tea and requires amelioration with acidic materials such as aluminium sulphate or elemental sulpher before tea is planted. He further reported that in East Africa the tea is unable to establish on the Hutsites because of too high base nutrient contents especially potassium and calcium. Such soils are acidified by using sulpher, aluminium sulphate or ammonium sulphate. Chenery [2] has pointed out that tea is a calcifuge and an aluminium accumulator and at the pH values arround 6.5 the exchangeable aluminiun is extractable only with difficulty in small quantities.

In Pakistan tea plantation has been commenced recently. The soils in prospective tea growing areas having the pH ranging from 5.6 to 7.0 should be acidified with elemental sulpher or aluminium sulphate [8]. The aim of present study is to evaluate the optimal dose of acidifying materials such as elemental sulpher and aluminium sulphate before the tea plntation.

MATERIALS AND METHODS

This study was conducted at National Tea Research Station, Shinkiari Distract Mansehra during 1992 and 1993. The experiment was laid out in a Randomized Complete Block Design with four replications and five treatments. The experimental plot was comprising 120 plants of Qi-Men (one year old) variety with 24 plants in each treatment. The plants were transplanted during the month of August in the pits (18"x 18"). Row to row and plant to plant distance was kept 4 and 2 feet respectively. The soil samples were collected at a depth of 0-15cm, 15-30cm and 30-45cm and pH was determined before starting the experiment(Table-I). Elemental sulpher was mixed with the soil in the pits two months before the transplantation, whereas, aluminium sulphate was mixed two weeks before the plantation[1].Treatmentwise distribution of the acidifing material was T1=