

## Determining Sugar Beet Potential Yield at Different Growth Stages

Dr. D. Fathollah Taleghani\*, Dr. I. Alimoradi\*,  
Dr. S. Sadeghzadeh Hemayati\*, Dr. R. Mohammadian\*,  
Dr. S.B. Mahmoudi\*, Dr. M. Abdollahian Noghabi\* & H. Karimi\*\*

### Abstract:

Given the importance of crop insurance in mitigating the risks and stabilizing the farmers' income, the present study was conducted to evaluate sugar beet insurance program and to propose a scientific-technical approach for determining production potential with simple practical tables and equations in Sugar Beet Seed Institute of Karaj, Iran in 2010-2012. The required data were gathered from Agricultural Products Insurance Fund, research centers of the provinces, the domestic and international data, and the evaluations of the models used in estimating the losses in different countries of the world. Then, two separate research projects were carried out in the field to unify the collected data, estimate the missing points and determine the confidence coefficient of the proposed models. At the end, the steps of determining potential yield under actual field conditions were formulated after analyzing the gathered data. In the present study, sugar beet yield was considered in three forms of potential, achievable and actual yield. Mean potential, achievable and actual yields of sugar beet were  $106.99 \pm 7.99$ ,  $75.63 \pm 8.36$  and  $30.85 \pm 5.00$  t ha<sup>-1</sup> in spring cultivation, respectively. In total,  $21.59 \pm 7.67\%$  of potential yield was lost due to the impact of the act of God and environmental stressful factors and  $54.53 \pm 7.30\%$  of achievable yield was lost due to the managerial factors. Out the studied regions, Ruydasht had the highest risk of act of God (43.80%) and Mahidasht the lowest one (16.10%). Also, in terms of yield loss caused by managerial factors, the highest and lowest losses (69.01 and 46.81%) were observed in Mahidasht and Piranshahr, respectively. To find out the effect of planting date, the functions of the yield loss due to delayed planting was evaluated in eleven-fold prairies of the country. In the case of the effect of plant deficiency and the weeds on final yield, the models for growth stages as mathematical functions were proposed. The damages of noxious insects and diseases were divided into three groups: foliar, root and weakening. Then, the magnitudes of the damages of these parameters were presented in tabular form. Finally, the effects of other parameters (including water stress, delayed weeding and fertilization as heading) were considered as field cover indices and the relevant table was given for determining the damages of incomplete field cover. Overall, the present study gave rise to the map of main sugar beet cultivation regions taking into account the climatic attributes of each region, the knowledge of main parameters affecting the production and determining their roles in final yield of sugar beet under farming conditions which can be used in determining the losses caused by managerial factors by agricultural products insurance companies.

### Keywords:

Insurance, Planting Date, Plant Density, Sugar Beet, Potential Yield, Agronomic Management, Sugar Beet Production Regions

\* Member of Scientific Board of Sugar Beet Seed Institute

\*\* Manager of Research & Marketing Group of A.I.F

