THE INFLUENCE OF THE MANAGEMENT TYPE ON THE UNEVEN-AGED STANDS FROM U.P. IV IADOLINA O.S. REMEŢI IN THE CONTEXT OF THE DURABLE DEVELOPMENT

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Abstract:
The type of management influences decisively the structure of the stands, that is why, the purpose of the present paper is to analise the structures of the unven-aged stands from U.P.IV Iadolina O.S. Remeţi and the way in which these are different from the model structures showed in the field literature. For the structures which, are a lot more different from the ones showed in the literature the proposition of some interventions through which these structures be closer to the theoretical ones was followed.

Key words: stand, structure, site, management methods, uneven-aged stands

INTRODUCTION

The structure of a stand can be defined as an interaction sistem between the element obeyed to modifications. These interactions give the stand stability and durability in time.

The structure appears as a general characteristic of the coexistence relations between the elements of the stand. The relations between the elements of the stand which define its structure can be of many types: gathering relations,asociation relations, size and domination relations. Each of these relation types distinctevly establish some characteristics of the structure of the stand. The gathering relations establish the consistence of the stands, the asociation ones-type of the mix, size and domination relations establish structure of the stand in a vertical plan(Bailey, 1995).

Structure of the stands is the result of the abiotic environment action and the interaction of the system elements. Among the complex interactions which influence the structure of the stand, the intraspecific and and interspecific relations have an important role (Filip, 1994). These interactions are obeyed to the capacity of the species for perpetuation in space and time. Among intraspecific relations the ones of embaresment and rivality can be mentioned and among interspecific relations the ones of favouring, embaresment and rivality are mentioned (Florescu and Nicolescu, 1998).

The forming and the dynamics of the structure of the stands is given on one hand by the competition, favouring, embaresment relations, the intra and interspecific cooperation and on the other hand by the interactions with the abiotic environment, taking into acount the genetic features also.

In the mixed stands, as in the case of European beech, European spruce and European silver fir stands, the competition, favouring and cooperation appear as interspecific rates. In the mixed stands the interspecific competition in minimum and the cooperation and favouring relations act in the way of asuring stability and perennity of the stands (Giurgiu, 1979).

As a result of the factors complexity which interfear in defining the structure of the stands it is necesary that on the basis of the concret conditions, the models which

correspond to silvicultural conditions, social- economical and ecological functions of the stands to be established (Giurgiu, 1972).

MATERIAL AND METHODS

European spruce, European silver fir and European beech mixed stands from U.P. IV Iadolina, are uneven-aged stands with structures suitable for selection system fertilization. The selection system stands show structures of stands distribution on diameter categories which theoreticly compare to Mayer relation. The theoretical frequences are established with the relation (Chițea, 1997):

$$\hat{n}_i = ke^{-\alpha x_i}$$

where: $\hat{n}_i$ reprezents the theoretical frequences;

e is the basis for natural logarithms (e=2,71828)

k and α are the function parameters

The work method contained field inventories on circular sample plots of 500 sm. On these sample plots all the trees with diameters over 12 cm were inventoried, these gathering in diameter classes from four to four centimetres. The hights and quality clasesses were established also through mesurements and observations.

The research method was based on observation, experiment, documentation and mathematical modeling. The structures in ratio with stands number were analized by adjusting experimental distributions to theoretical ones. The comparancy of the experimental distributions with the theoretical ones through conformity tests.

The characterization of European spruce, European silver fir and European beech mixed stands structure was made through:the analisys of the experimental distributions for the main biometrical characteristics of the stands and analisys of the corelations between biometrical characteristics of the stands through adequate regresion equations.

RESULTS AND DISSCUTIONS

The studied stands are clasified in 3 different categories in ratio to stands distreibutions on diameters categories. This way, first category is reprezented by stands whose structure is comparable to selection system structure (see fig.1). Another category reprezented by figure 2 is contained of stands which show an excedent of trees in the middle categories fact which can be straightened through silvotechnical solutions applied by
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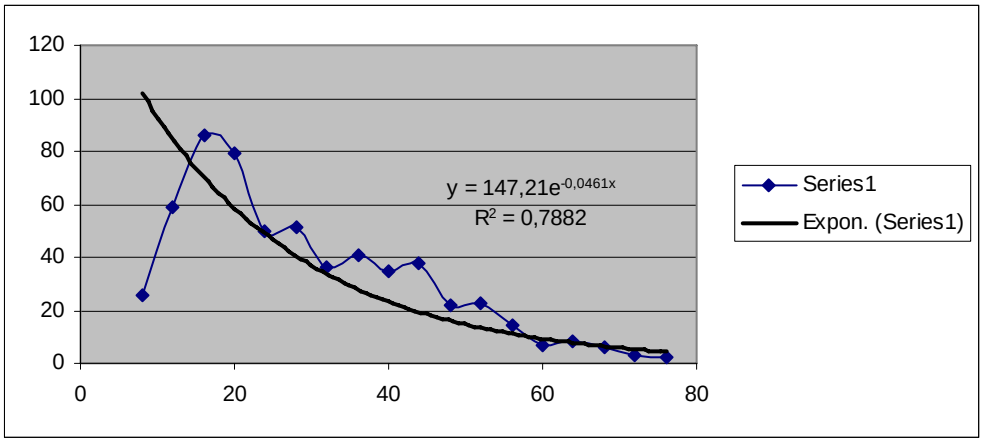

Fig. 1. Theoretical and experimental distribution of the stands on diameter categories in ua.41a, U.P. IV Iadolina, O.S. Remeți

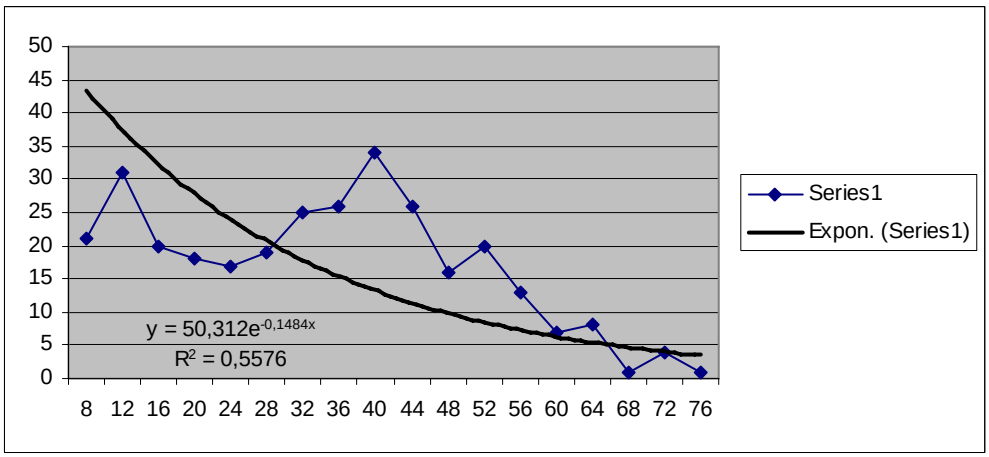

Fig. 2. Theoretical and experimental distribution of the stands on diameter categories in ua.35a, U.P. IV Iadolina, O.S. Remeți

The third stand category is represented by relatively even-aged stands (fig.3) whose structure is comparable to regular even-aged structure.

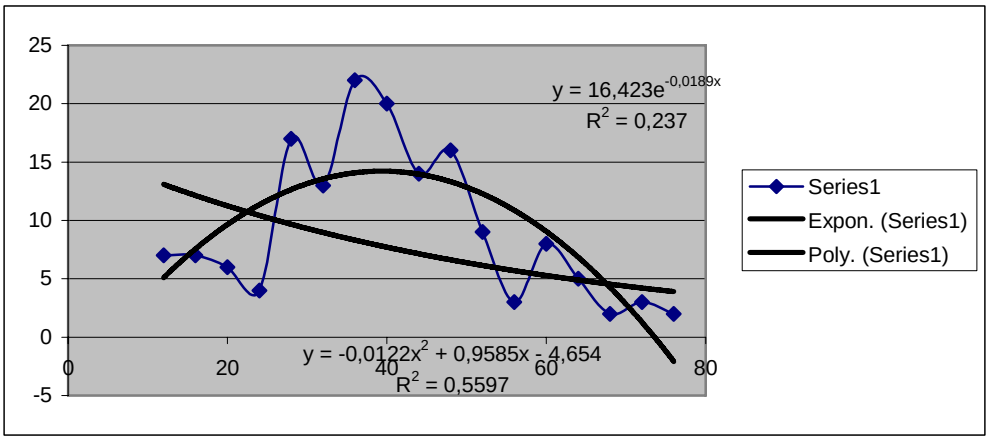

Fig. 3. Theoretical and experimental distribution of the stands on diameter categories in ua.49c, U.P. IV Iadolina, O.S. Remeți

From the analisys of figure 1 many interesting aspect come up concerning the structure of the stands taking into study. This way the stands of this kind are considered selection system type, application of this treatment being entirely entitled. The structure is similar to the theoretical one that is why the interventions on the stands will have as main goal mantaining the selection system type structure. The trees considered to be cut down are those from over-numbered tree categories, bad configurated ore with some vizible errors.

By simulating an intervention in this kind of stands it was established that basic areas will have to be reduced by cutting trees from overplused diameter categories with values between 10 – 15 %. This way the nutrition space for the rest of the trees will get bigger, natural regenaration will be favourized and the stand as structure will be closer to the theoretical one. In the stand from 41a after an intervention which implied decreasing the basic area from 39,06 sm/ha to 33,43 sm/ha the following distribution (figure 4) with a corelation coefficient of 82,9% rezulted.

The stands tipical for the second category requires for normalizing the structure interventions of bigger intensity ore 2 even 3 interventions of moderate intensity. For example in stand 35c the intervention intensity on basic area will be 17%, operation which will have to be followed in time for making the stand structure a selection system one.

The stands from the third category have similar structures regular stand structures and as a result these need long periods of time with sustained interventions for obtaining the selection system structure. It will be followed the standing tree volume doesen`t decrease under 0,8 – 0,9 from the established optimal volume

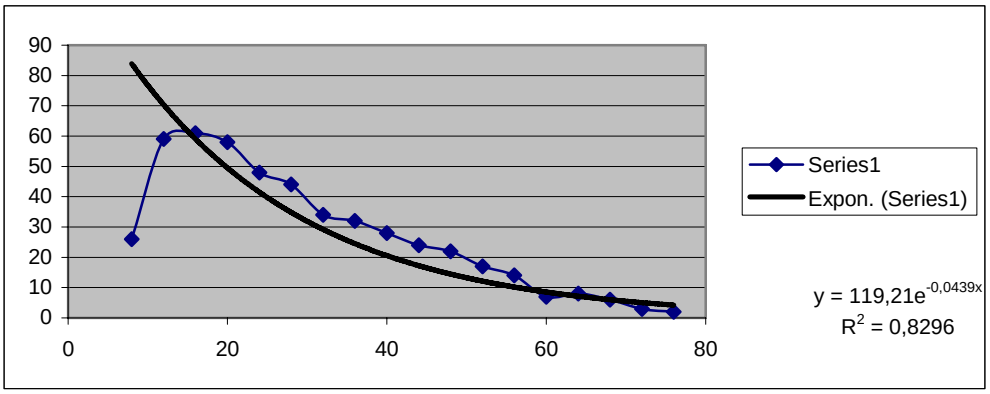

Fig. 4. Theoretical and experimental distribution of the stands on diameter categories in ua.41a, U.P. IV Iadolina, O.S. Remeți after an intervention with intensity of 14,4% on basic area

CONCLUSIONS

The selection system stands show a remarcable stability to disturbant factors action and as a result, whenever possible the solution for applying cultural selection system will be adopted. The structure as a way of identification of a stand is the result of the management type. In such a context the way of applying the silvotechnical works is decisive in structuring the stand (Leahu , 1994, 2000, 2001).

In U.P. IV Iadolina, O.S. Remeți 3 kinds of stand were identified in ratio to the adjustment way with the theoretical selection system distribution. This way type I stands (figure 1) are part of uneven-aged stands with selection system structure, applying thistreatment and mantaining these structures being absolutely necesary for consolidation of these structures and mantaining stability of the stands.

Type II stands (figure 2) are similar in a way to regular stands in the middle part of diameter categories. Still for interventions with bigger intesities than for type I stands these can reach the selection system structure. Reaching this fase can be made in 2 ore 3 cuttings which will allow through moderate intervention intensities mantaining the existente balance in forest ecosystems.

Type III stands have a similar structure to normal structure and as a result changing to selection system structure will require transformation works towards selection system.

REFERENCES :

1. Bailey N.T.J., 1995, Statistical methods in Biology. Third Edition. University Press, Cambridge
2. Chițea Gh., 1997, Biostatistică, Editura Universității Transilvania, Brașov
3. Giurgiu V., 1979, Dendrometrie și auxologie forestieră, Editura Ceres, București
4. Giurgiu V., 1972,Metode ale statisticii matematice aplicate în silvicultură, Editura Ceres, București
5. Filip M., 1994, Measuring trees and forests, Editura Cab International ediția II, London
6. Florescu I., Nicolescu N., 1998, Silvicultura, vol. I – Silvobiologia, Editura Universității Transilvania, Brașov
7. Florescu I., Nicolescu N., 1998, Silvicultura, vol. II – Silvotehnica, Editura Universității Transilvania, Brașov
8. Leahu I., 1994, Dendrometrie, Editura Didactică și Pedagogică, București
9. Leahu I., 2001, Amenajarea pădurilor, Editura Didactică și Pedagogică, București
10. Leahu I., 2000, Un model de simulare pentru determinarea efectului măsurilor silvotehnice aplicate, Buletinul Ştiințific, Universitatea din Oradea