

## ミズナラの構造材林作業法に関する研究

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## Study on the High Forest System of MIZUNARA (*Quercus crispula Blume*).

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### Résumé

This is a report of the theoretical and practical study on the high forest system of MIZUNARA.

Firstly, the author considered the characteristics of MIZUNARA connected with the formation of the high forest of MIZUNARA and the quality required for the structural timber of MIZUNARA. Based on the above characteristics and quality, the author clarified the necessary basic conditions as follows.

- 1) At the regeneration period, dense seedlings per unit area must be secured.
- 2) At the early young period, the single uniform condition of the upper story crown must be constituted.
- 3) After the middle-aged period, the diameter growth must be expedited by adopting the crown thinning method.
- 4) At the yield period, the ripe old forest which is composed of large diameter trees must be formed by adopting the long cutting cycle.

Secondly, the author made the theoretical study on the high forest system of MIZUNARA. Based on both the necessary basic conditions and the characteristics of MIZUNARA, the author considered the applicability of various kinds of the working system to the formation of the high forest of MIZUNARA, mainly from the silvicultural point of view. Judging from the above considerations, the theoretical basis of the working system which should be applied to form the high forest of MIZUNARA is the natural regeneration which utilizes the seeds fallen from the trees for final cutting by means of clear cutting. The basic application method of this working system to the unit forest which parcels the whole forest is as follows.

150-year-old forest which comes to the final cutting age is cut clear in the winter period after the seeds of the trees for final cutting have fallen on the forest floor in the autumn period of the good crop year, and in consequence of the above cutting method seedlings generate from the fallen seeds in the next spring period in the cut-over area.

Thirdly, the author made the practical studies on the high forest system of MIZUNARA which were consisted of the basic study and the applied one. In the basic study, the author clarified the characteristics of MIZUNARA by the experiments, which were carried out with the view to clarify seed crop of stands, germination of seeds, seed dispersal from stands, growth of seedling in stands

with different degrees of shade, root system of seedling, growth of young dominant trees in stands with different densities, and growing processes of stand, and then considered the results obtained by the above experiment from the silvicultural point of view. The results of considerations are summarized as follows.

- 1) The amount of the seeds fallen from trees for final cutting is great in the good crop year, and if these fallen seeds can be utilized for the natural regeneration in the final cutting period, dense seedlings could be secured in the next spring period.
- 2) It is not rational that regeneration by clear cutting system utilizing the seeds from adjoining stands, by shelterwood system, and by selection system is applied to the formation of the high forest of MIZUNARA.
- 3) In the case of planting MIZUNARA, the method which can maintain the natural root system of seedling (q.v. Photo.-3·1—3·4) should be adopted.
4. Since, in the case of MIZUNARA, the dominant trees appear naturally in the dense stand of single uniform condition and the height growth of these dominant trees do not decline, it is rational from the silvicultural point of view that the single uniform condition of the upper story crown is constituted in the early young period.
5. It is presumed that in order to form the high forest of MIZUNARA, 100,000 seedlings per ha in the first year of regeneration and 30,000 young growths per ha in the fifth year after regeneration should be secured at least.
- 6) The first thinning should be carried out just as soon as the mean clear length of the potential trees for final cutting reaches 7 meters (in other words, 35-year-old).
- 7) The aim of the stand composition and yield timber of unit forest in the final cutting period is represented by Table-3·21.

In the applied study, the author clarified the silvicultural techniques which need to form the high forest of MIZUNARA in the unit forest which parcels the whole forest under the above working system which utilize the seeds fallen from trees for final cutting by clear cutting. These are, in order, soil preparation for seeding, aid-to-sowing, soil covering for fallen seeds, regeneration cutting, branches and twigs salvaging, aid-to-planting, weeding, salvage cutting, pruning, and thinning. Each of the above silvicultural techniques except aid-to-sowing and aid-to-planting was practically experimented. Based on the results of the above experiments, the author tried to organize systematically the whole of the silvicultural techniques. The standard application method of this working system to unit forest obtained by the above organization is summarized in Table-4·1.

According to the foregoing results of this study, it is clear that in the case of the formation of the high forest of MIZUNARA by the above working system which utilize the seeds fallen from trees for final cutting by clear cutting, the

standard method which is represented by Table-4.1 should be applied to the unit forest, and it should aim to form the stand for final cutting and to yield final products which are represented by Table-3.21, by adopting 150 cutting cycle. Based on the characteristics of this working system, it is observed that in the case of the organization of the whole forest under this working system by the unit forest, the whole forest above should be organized by as sm all unit forest as possible, which should not adjoin one after another but separate one from another by the forest road network covering broad area, and this working system fits to the large-scale forest management.