

The variety diversity at the wheat is a guarantee for success in stress conditions

General rules for variety structure forming of the wheat

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*In the present feature information is given regarding the general rules for variety **structure forming of the wheat**. In our country winter breadmaking wheat has been sowing traditionally. The climatic conditions for the wheat cultivation in our country are severe as a whole. Every year there are periods of sub-zero temperature stress (cold) in the winter but the dry up during the different periods of active vegetation are often for many regions. The high temperatures at comparatively low moisture reserves in the soil during the grain ripen are a reason for cutbacks in the grain yield. This requires a special approach to all activities connected to the wheat cultivation in conditions of these real risk moments. It is explained that during the choice of particular group of varieties, besides their biological characteristics, the quality of the applied agricultural techniques is important, so as the active adjustment of the farmer to optimize the achieved results. It is underlined that the varieties choice depends on the property of the grain that the grower chases as goods for realization. Information has been submitted from real data of the yield for eventual risks during wrong variety choice in condition of abiotic stress.*

1. General information

Our country is situated in a zone of risk agriculture considering the temperature as a wheat growth and movement factor. The flat part of the country is suitable for cereals yield. At the flat part there are suitable for wheat cultivation conditions which are different by regions and therefore have to be read in the corresponding agricultural techniques of the culture. Every year near 4.0 – 4.2 millions of tonnes wheat grain is produced in R. Bulgaria from near 11.5 decare area. This indicates that the average yield for the country is near 380kg/decare. Comparing these indexes to the last years of socialistic Bulgaria 5 -5.3 millions of tonnes (1988 - 1989), we state that to achieve the level it is necessary to increase the yield with 15-18%. Because the half of the annual grain is exported, its quality has to be in balance with the yield to realize the normal for the farmer price. The unexpected temperature anomalies are usual like in the wintertime without motion so as during the phases of active vegetation. During the last 15 years, these anomalies became a rule not an exception. Every year in many regions of the country a clear expressive penury is obtained because of the rains penuries which bring dry up or the other way about. A clear example for this is the unprecedented heavy rains during the past 2014 in front of the record temperatures. Parts of the soils have badly for the culture water regime. To water the wheat is impossible during dry up. The culture does not stand a continuous period of over moisture and we may say that the wheat is sensitive against it. Not full technology has been still applied during cultivation in result of low investments during the wheat cultivation. The annual periodic and sometimes drastic alterations in the prices of the grain are a precondition for low rentability. In the country economically successful are cultivated other cultures as maize, sunflower and colza which is a precondition the farmers to hesitate what area wheat to pledge for the next year in front of the other cultures. In many cases the higher profit gained from the other cultures is a reason for increasing the wheat area. The knowledge for wheat cultivation of the farmers is still small. That is why ways have to be look for (variety composition and adapted technology) decreasing the cultivation risk to transform the wheat again in annual profit culture.

2. The wheat and its special features

The winter wheat is a culture cultivated during all seasons which makes $\frac{3}{4}$ from the duration of a calendar year. This is very important to be underlined and known that during every period of the separate seasons, it needs special conditions for optimum growth and movement. A great part of these conditions do not depend on the human intervention. The wheat biology is unique too because it depends on special requirements of the temperature, light and moisture, movement phases and growth stage. Each anomaly in one of these factors creates a risk during the cultivation, especially if it is more prolonged. In view of the final result – the grain yield might be considered that the wheat cultivated every year in conditions of non-conformity between real meteorological conditions and biological requirements –which to the point is stress. Gradually during the vegetation this non-conformity became obstacle for the realization of the wheat genetic potential which here is near 1100kg/decare. This yield potential created by the selection as a whole realizes to near 40% In different years the yield became to 50% but in others decreased to 28%. This means that in normal human interference according to the conditions, this yield might be increased at least with 10-20% which has already achieved (1989). On the grounds of many approaches and studies, the experts consider that by optimization of the **wheat variety structure** this potential might be increased permanently with near 10%. Of course this will happen if the specific behaviour of the variety is well-known in relation to the concrete cultivation conditions. By

responding to its specific technologic actions, it is possible the grain yield to be increased with additional 6-8%. By this way it is visible that the things are not so easy to happen.

As a matter of principle the said forth reasons are indicators that the wheat cultivation technology must not be applied conventionally during every season. It must be totally consistent with the biology of the culture by periods, the characteristics of the separate varieties and the concrete meteorological situation of the year. Only by this way the farmer might stimulate actively and efficiently to "help" the wheat to form high yield and grain property.

3. Reasons to apply the variety culture

Is it possible to set against the negative influence of the cultivation conditions? Yes is the explicit answer to this question. The correct execution of concrete actions in the agricultural techniques is not also a principle matter. It is difficult to execute complex and without template technological behaviour at the cultivation according to concrete situation during the different periods of vegetation. To achieve it, we need knowledge connected to the rational usage of the created culture varieties. The necessity of several varieties cultivation in a farm is a subject of permanent discussion between experts and growers. The shortest and correct answer of this question is that it is one of the ways for effective decreasing of the negative influence over the yield and the grain property from the annual unforeseen changes in the conditions in which the wheat is cultivated.

Now the practice has an access to many varieties of the Bulgarian and foreign selection. The abundant choice from among over 50 varieties in the Official variety list of the country causes a problem to the farmers which varieties to choose and why. Because of this the farmer has to be informed about the biological and agriculture qualities of each variety and to know the forming principles of variety structure. Considering the stress during wheat cultivation, the principles during choice are a compulsory precondition for success.

The cultivation of several varieties in the grain cultures is based on one general principle in the nature connected to the vitality of specific plant. Thanks to it this significant diversity of the plant and animal life have been formed. At simple language it might be formed as follows: the stage of grain yield reducing in varieties group depending on the contrary conditions of the environment is always weaker than those to any other single variety. For example if three varieties are cultivating – sensitive, middle tolerant and tolerant against layer, the average yield from the three together in similar other factor always will be higher than those to the sensitive two varieties. Higher the number of the varieties in the group is, the stage of negative influences is weaker. This "iron" principle is the base for achieving stable by years and areas yields and high quality. During the past 15 years the world has talked for "stable" agriculture which is a synonym for what we are discussing here.

The main reasons to cultivate several varieties determining each concrete variety structure are: **1)** The wheat is a culture of the microclimate and its reaction depends mainly on the concrete conditions of the year and the separate periods of rest and active vegetation, **2)** Availability of differences in the soils of the field which has influence especially over the technological decisions, **3)** availability and how often a periods of stress are happening (temperature and moisture in the soil) during cultivation so as its power and continuance, **4)** the created and available great genetic diversity of varieties which are created in the Dobrudzha conditions, **5)** Real acting system for variety support and seed production of the most adapted varieties for the different regions of the country. Each of the mentioned above reasons is a factor, information for which could assist very much for an effective yield.

4. The variety factor

The variety composition is a precondition for successful cultivation of the wheat. By this reason many varieties are created, which give good results in different environmental conditions each. In this connection in many countries ecologic (after registered) tests are organized by which information is collected regarding the suitability of specific variety for specific region for years. By this way the farmers are supported by forming advisable variety list for specific region. By the variety list the subjective choice largely laid on objective (not commercial) basis. The varieties created by Agronom Company are cultivated in similar tests in the whole country, which purpose is their zoning according to the registered real yield results. An elementary truth that recently some of the growers are inclined to forget that all created for the conditions of the Republic of Bulgaria varieties are the most suitable for the climate of the Balkan Peninsula. It is happen because of the purposeful selection in our country which joins the useful signs and properties of the Bulgarian with Romanian, Serbian, Ukrainian and Hungarian varieties. Successful zoning is executed by the knowledge of the farmer about:

- 4.1. The biological features of the varieties;
- 4.2. The agricultural signs connected to the yield and/or the property;
- 4.3. The adaptability of the different varieties to the conditions;
- 4.4. Technological characteristics connected to the genetic and biology;
- 4.5. Technology characteristics during cultivation in risk conditions;

In conclusion we may generalize that for the wheat is necessary to be cultivated not one but several varieties in a farm. The choice of these varieties is hard but concrete for every farmer after taking into consideration the characteristics of the region as conditions, and the yields from particular variety there. These important and principle moments for the cultivation of each variety will be a subject of principle analysis in the next copy.