Varieties of Spring Barley for Beer Obtained at Agricultural Research and Development Turda

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Abstract. Barley breeding laboratory from ARDS Turda created many varieties of spring barley in two rows with superior brewing qualities of which the best quality are grown on large areas. Of varieties obtained from ARDS Turda: Daciana, Capriana, Jubileu and Romaniţa, the last two are high quality and productive. They maintained their superior qualities during several years of experimentation in different localities. These two varieties are genetically stable in terms of varietal purity correspond to the current rules EU.

Spring barley varieties with two rows Daciana and Romaniţa have a high ecological plasticity and can be grown on different areas which can range in climate and soil. These two varieties have superior qualities than older local and foreign varieties, with a very good resistance to fallen, feature very important to malting barley. This phenomenon is important because greatly depreciates the grain quality and reduce production. Characteristics of barley for beer: varieties containing less than 12.5% protein; varieties with high starch content 60%; varieties with greater than 95% germination energy.

Daciana and Romaniţa are superior varieties for brewing and have a low percentage of protein between 10.9-12%. Percentage of starch is high an is between 61-62.3% of dry weight and have a high production potential.

Keywords: breeding, genotypes, quality, malting barley, commercial varieties

Introduction. Quality of spring barley with two rows for beer depends on grain quality, consisting of starch content which must be high and protein content that must be low.

For brewing, spring barley varieties the best protein content must be 10 – 12% and starch content over 66% (Potlog et al., 1980).

Spring barley with two rows is better in the brewing industry comparative with six rows barley because the following reasons: grains are large and more uniform, the coats of grains are fine and have a good filtering capacity and they have a lower protein content and a higher starch content (Ion, 2010).


Aims and objectives. In the breeding process of spring barley, our principal aim was to create high yielding cultivars, well adapted to the ecological conditions, resistant to lodging and the main diseases and superior quality traits, as compared to the original cultivar Turdeana and Daciana (Munteanu and Tuşa, 1999).

Obtaining varieties with low protein content, associated with high starch content, high thousand grain weight and high germination energy over 95%. Last time, due to dry and
warm climatic conditions, obtaining varieties resistant to drought lately is becoming of high importance.

The other important aim for new varieties obtained in the breeding process is improve the uniformity must comply with current UE requirements that are very high.

**Materials and methods.** Our targets have been accomplished, by using within the hybrid combinations, new genotypes, intensive cultivars resistant to lodging, originated from West – Europe North and Asia (Munteanu and Tuşa, 1999).

Lines and varieties of spring barley with two rows created in Turda were obtained by hybridization method followed by individual selection (pedigree). Ecological testing varieties Daciana and Romanita have been performed three years in four locations of A.S.A.S. network: Turda, Brașov, Suceava and Miercurea Ciuc.

**Results and Discussion.** This paper presents results for the protein and starch content of spring barley varieties with two rows: Daciana and Romanita created at ARDS Turda beside of other foreign and local varieties. There are presented also results of the perspective lines completed in the breeding program and tested in the ecological network of ISTIS.

Test results of spring barley lines with two rows of Agricultural Research and Development Turda in ISTIS network in 2010 in six locality: Tg. Secuiesc, Şimleul Silvaniei, Sibiu, Rădăuţi, Hărman and Dej. Similar results were obtained in 2009 (Table 1).

<table>
<thead>
<tr>
<th>Varieties</th>
<th>Yield Kg/ha</th>
<th>%</th>
<th>Days from sowing to head emergence</th>
<th>Days from head emergence to maturity</th>
<th>Thousand grain weight (TKW, g)</th>
<th>Test weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daciana mt.</td>
<td>3510</td>
<td>100</td>
<td>55</td>
<td>43</td>
<td>39</td>
<td>57</td>
</tr>
<tr>
<td>Maria mt.</td>
<td>3320</td>
<td>95</td>
<td>59</td>
<td>38</td>
<td>40</td>
<td>57</td>
</tr>
<tr>
<td>Thuringia mt.</td>
<td>2814</td>
<td>80</td>
<td>54</td>
<td>43</td>
<td>37</td>
<td>54</td>
</tr>
<tr>
<td>To 2270/94</td>
<td>3780</td>
<td>108</td>
<td>54</td>
<td>43</td>
<td>39</td>
<td>57</td>
</tr>
<tr>
<td>To 2208/02</td>
<td>3845</td>
<td>110</td>
<td>55</td>
<td>43</td>
<td>40</td>
<td>57</td>
</tr>
</tbody>
</table>

Our research is focused on the induction of genes in the genome of the new varieties for improve weight of grain and elasticity of straw increasing resistance to lodging. In the breeding program we are using the new European well-adapted varieties and lines obtained from Turda well suited to local conditions.
**Conclusion** Daciana and Romanita varieties have protein content between 10.5-12.5% and a high percentage of starch over 62% and they are suitable for brewing. Daciana variety possess genes for reduce height of plant, so it is a short variety.

New lines To 2270/94 and To 2208/02 have a high potential production over varieties Daciana and Thuringia, are resistant to lodging, have good disease resistance and meet the requirements for the brewing industry. These lines have protein content between 10-11.5%, starch content is between 62-63.5% and have higher germination energy between 97-98.5%. Lines To 2270/94 and To 2208/02 have large, uniform grains and fine palea. These lines will be improved in terms of uniformity and in the future will probably be approved as new varieties.

**REFERENCES**