ABRC QUALITY CONTROL

updated 3/12/2019
Why Talk About QC Now?

- Increased number of stocks in the collection
- Increasing number of specific types of stocks that require more attention
- The development of new methodologies producing a number of new types of resources
- Time required to collect certain number of user complaints

- **We have always done QC!**

- In the past few years, it has grown to become a separate part of our operation

- We have collected for 4 years worth of data; only data from last year are presented
# Types of QC performed at ABRC

## Internal QC

<table>
<thead>
<tr>
<th>DNA</th>
<th>Seed</th>
</tr>
</thead>
<tbody>
<tr>
<td>New donation</td>
<td>New donation</td>
</tr>
<tr>
<td>DNA stock replication</td>
<td>Seed reproduction</td>
</tr>
<tr>
<td></td>
<td>Seed preservation</td>
</tr>
</tbody>
</table>

## User complaints

<table>
<thead>
<tr>
<th>DNA</th>
<th>Seed</th>
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</thead>
<tbody>
<tr>
<td>Insert in a clone not present</td>
<td>Cannot identify insertion in a T-DNA line</td>
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<tr>
<td>Wrong locus</td>
<td>Germination problems</td>
</tr>
<tr>
<td>Wrong stock</td>
<td></td>
</tr>
<tr>
<td>QC Method</td>
<td>DNA</td>
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<tr>
<td>-----------</td>
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<tr>
<td></td>
<td>• Sequencing</td>
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<tr>
<td></td>
<td>• Restriction digest</td>
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<td></td>
<td>• PCR</td>
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</tbody>
</table>
We welcome any feedback you can provide for the stocks we distribute. This information can include:

- Verification of an insertion
- PCR results
- Sequencing results
- Incorrect background
- Problem with germination / viability
- Problem finding the insertion
- Unexpected genotype/zygosity
- Incorrect stock

Your comment can be added directly to the stock record in TAIR. Go to the stock detail page, scroll to the bottom, and click on “Add My Comment”. If you have noted a problem, ABRC will do the appropriate Quality Control and post our results there.
User Complaints: Germination

What happens when a researcher reports a problem with germination?

• We will send the researcher a new batch of seeds
• We will perform a germination test
• We will let the researcher know the results of our test
• If there is a discrepancy we will work with the researcher trying to understand what that discrepancy is
• If the stock is below 81% germination the stock will be replanted
Germination Test Results

Seed Quality Control 2018

- Internal QC: 1742 stocks failed QC, 4443 stocks passed QC
- User Complaints QC: 21 stocks failed QC, 37 stocks passed QC
User Complaints: T-DNA Insertion Lines

Problems:

• Cannot identify insertion in a T-DNA insertion segregating line
• SALK_C* confirmed line is segregating
• Cannot identify insertion in a SALK_C* confirmed line

*SALK_C: confirmed from SALK, SAIL, GABI-Kat and WisconsinDs-Lox collections

Action:

• Problems with identifying an insertion are flagged in the local database
• When two researchers report a problem, we make that line “not_distributed” and only available by special request
• We test the lines with one problem
T-DNA Insertion Lines – QC Flow

User complaint

Enter problem (ID insertion) in local DB

Is there more than one problem?

No

Genotype at ABRC

Is the line wild-type?

No

Is the line homozygous for the insertion?

Yes

Add comment in local DB

Yes

Make the line not_distributed and make segregating parent available

ABRC genotyping confirmed presence of the T-DNA insertion in a homozygous state using primers suggested by SIGnAL T-DNA primer design tool.

Add comment in local DB

Availability
not_distributed
Availability Comment
Available by special request. Two or more researchers have reported a problem with this line. Contact ABRC for details.
DNA Stocks QC Flow

1. User complaint
2. Donation
3. Determine sample size
4. Test* at ABRC
   - Sequencing
   - Restriction Digest
   - PCR
   - *single colonies of the original and the distribution stock
5. Change availability
6. Ask donor for a replacement stock
7. Send a replacement
8. Inform user
9. Make new stock available
10. Test shows that there is a problem with a stock
DNA Stocks: QC Results

DNA Quality Control 2018

Donation QC
- Stocks failed QC: 3
- Stock passed QC: 21

User Complaints QC
- Stocks failed QC: 14
- Stock passed QC: 19
Seed Stocks: Error Rate

\[
\text{Error Rate} = \frac{\text{number of user complaints}}{\text{number of stocks ordered}}
\]

Germination Problems (January 2018-December 2018)

• Reported Error Rate: \( \frac{58}{68,404} = 0.0008 \) (between 4 and 5 sigma level)
• Confirmed Error Rate: \( \frac{42}{68,404} = 0.0006 \) (between 4 and 5 sigma level)

T-DNA Lines Insertion ID Problems (October 2007-December 2018)

• Reported Error Rate: \( \frac{1,014}{616,306} = 0.0016 \) (between 4 and 5 sigma level)
• Confirmed Error Rate: estimated at \( 0.001 \) (between 4 and 5 sigma level)