

Technical Working Party on Automation and Computer Programs **TWC/37/6**

Thirty-Seventh Session
Hangzhou, China, October 14 to 16, 2019

Original: English
Date: September 10, 2019

BUILDING A DATABASE WITH MOLECULAR MARKER INFORMATION FOR THE MANAGEMENT OF VARIETY COLLECTIONS

Document prepared by an expert from China

Disclaimer: this document does not represent UPOV policies or guidance

The annex to this document contains a copy of a presentation on “Maize DNA fingerprint database management system”, to be made at the thirty-seventh session of the TWC.

[Annex follows]



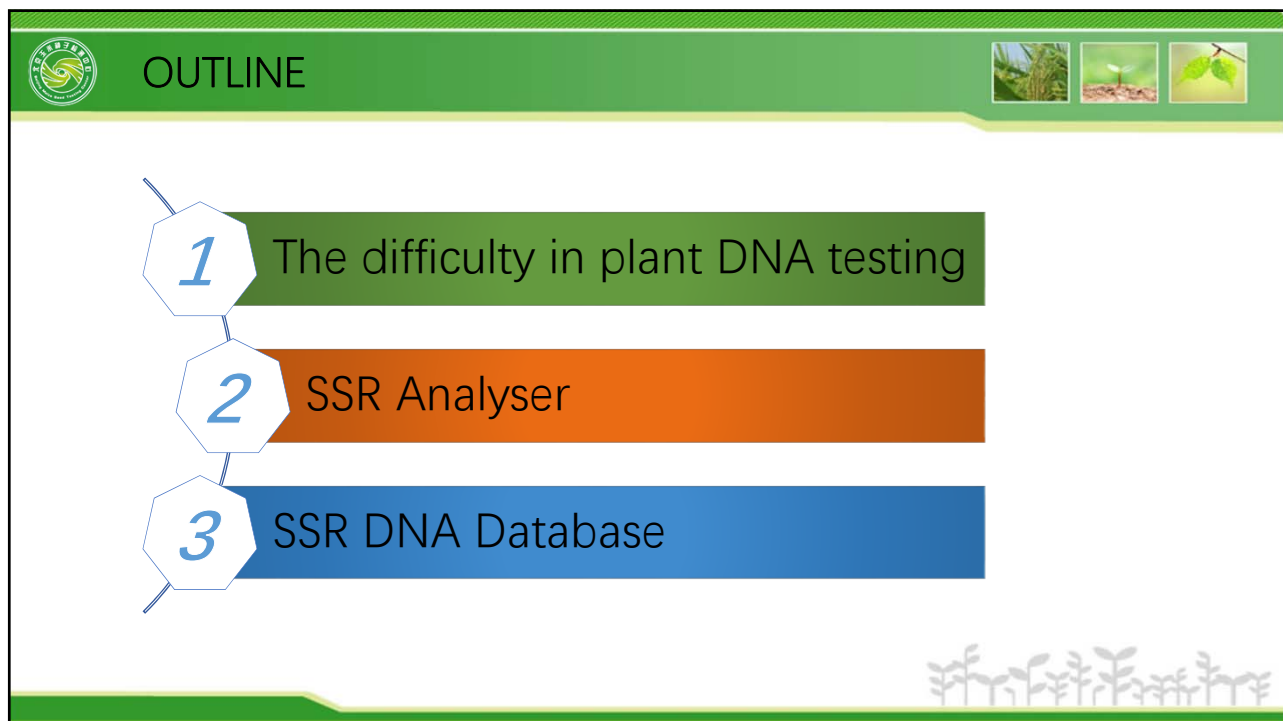
The title slide features a green header with a circular logo on the left. Below the header, a decorative row of small images shows various stages of maize growth: a leaf, a flower, a seedling, a young plant, and a mature plant. The main title, "Maize DNA Fingerprint Database Management System", is centered in a large, bold, black font. To the right of the title are two circular logos: one for the Maize Research Center (MC) and another for the Beijing Academy of Agriculture and Forestry Sciences. Below these logos, the text "The Maize Research Center, Beijing Academy of Agriculture and Forestry Sciences, China" is displayed. The slide is framed by green borders at the top and bottom.




Maize DNA Fingerprint Database Management System




The Maize Research Center, Beijing Academy of Agriculture and Forestry Sciences, China




The outline slide features a green header with a circular logo on the left and three small images on the right. The word "OUTLINE" is centered in the header. Below the header, three numbered items are listed, each with a colored bar: "1 The difficulty in plant DNA testing" (green bar), "2 SSR Analyser" (orange bar), and "3 SSR DNA Database" (blue bar). The numbers 1, 2, and 3 are enclosed in white hexagons with a blue outline. The slide is framed by green borders at the top and bottom.



OUTLINE

- 1 The difficulty in plant DNA testing
- 2 SSR Analyser
- 3 SSR DNA Database





The difficulty in plant DNA testing



Need for the efficiency of DNA DB construction



Difficulties in management of DNA test



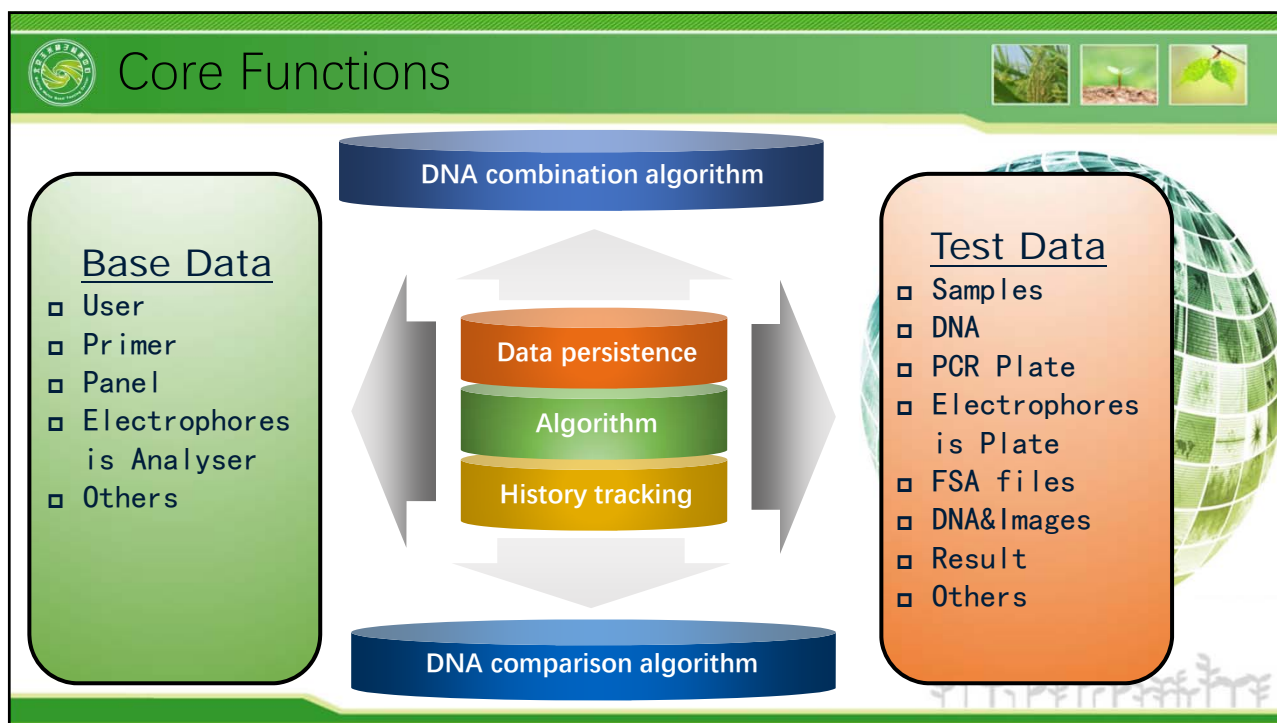
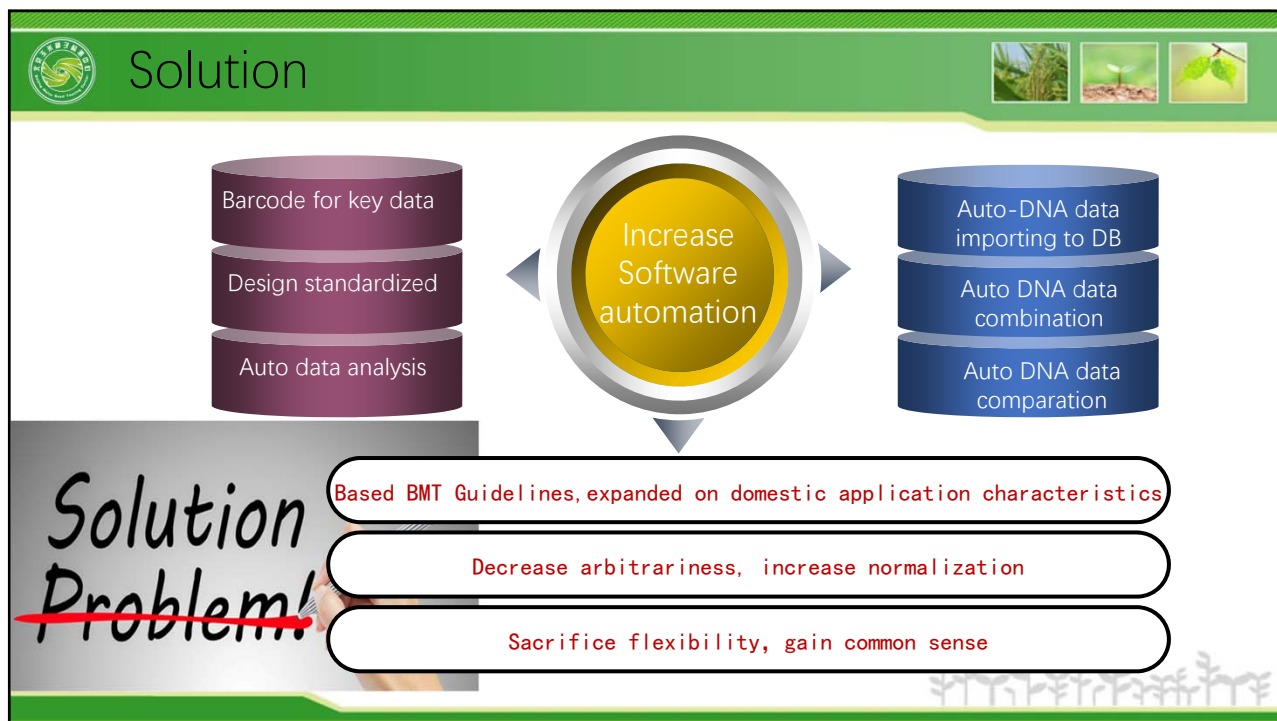
Issues of plant DNA data analysis

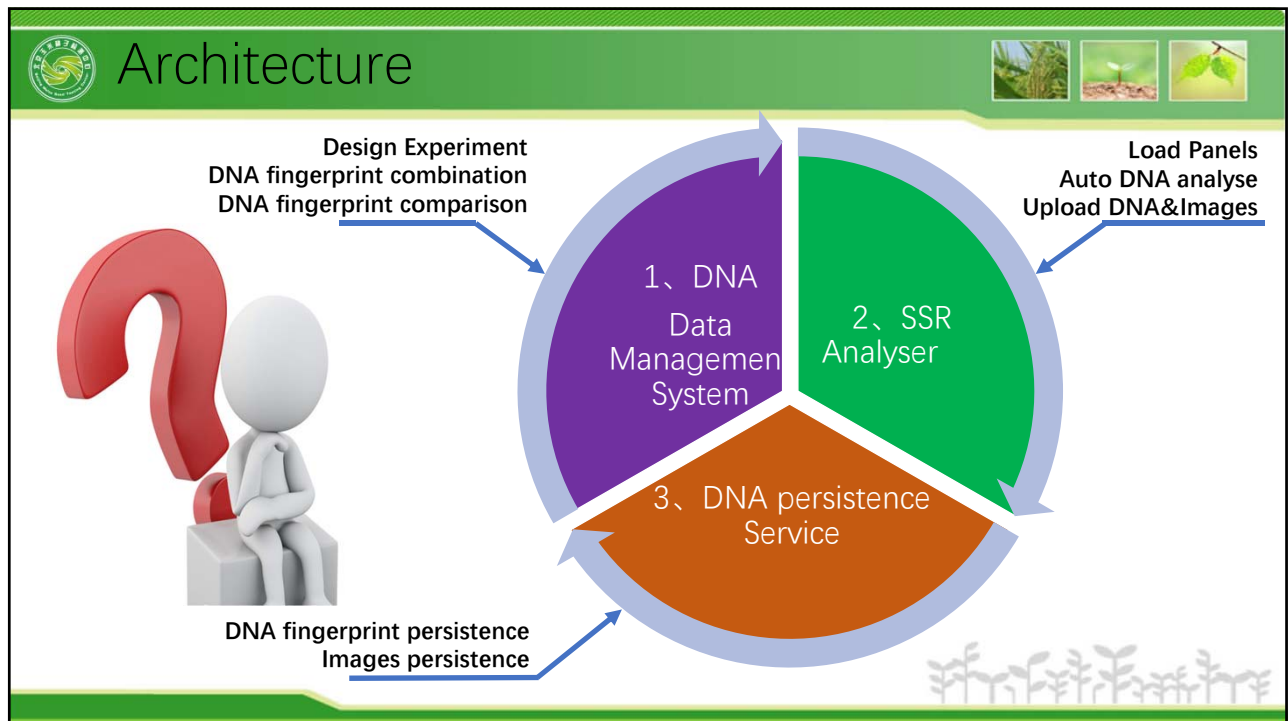
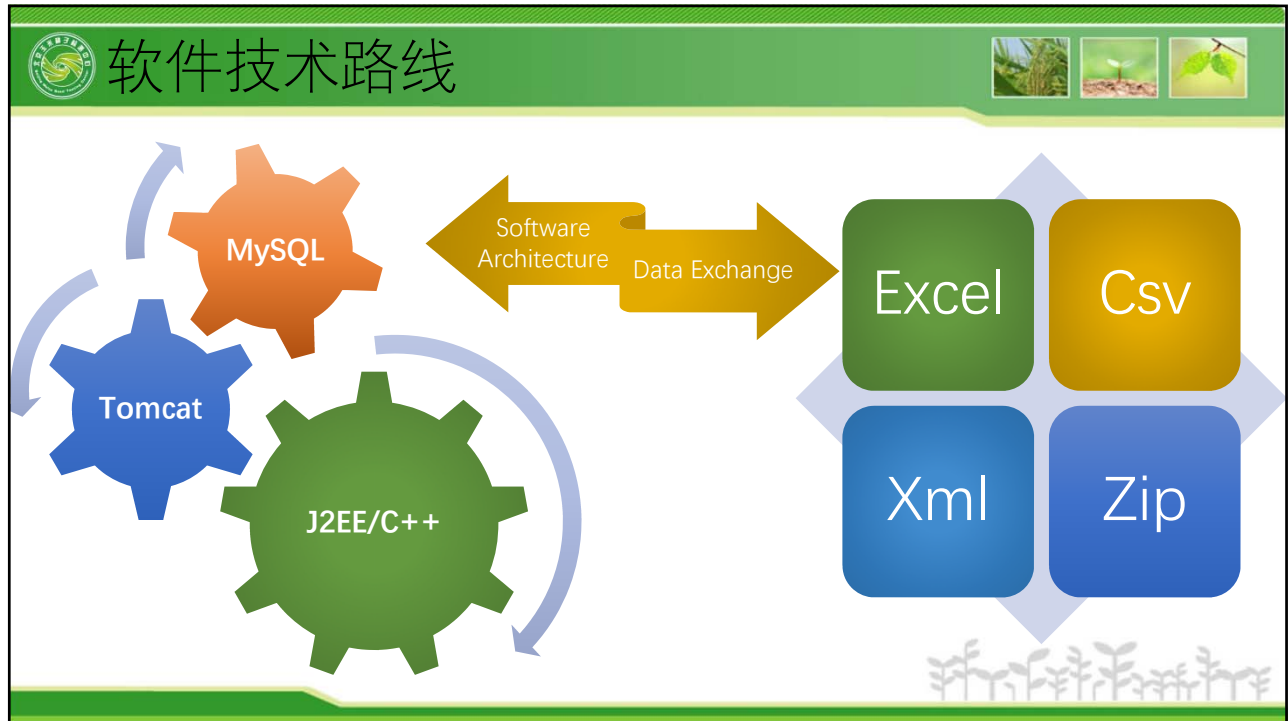


Need for the efficiency of DNA data analysis

Low efficiency for data processing







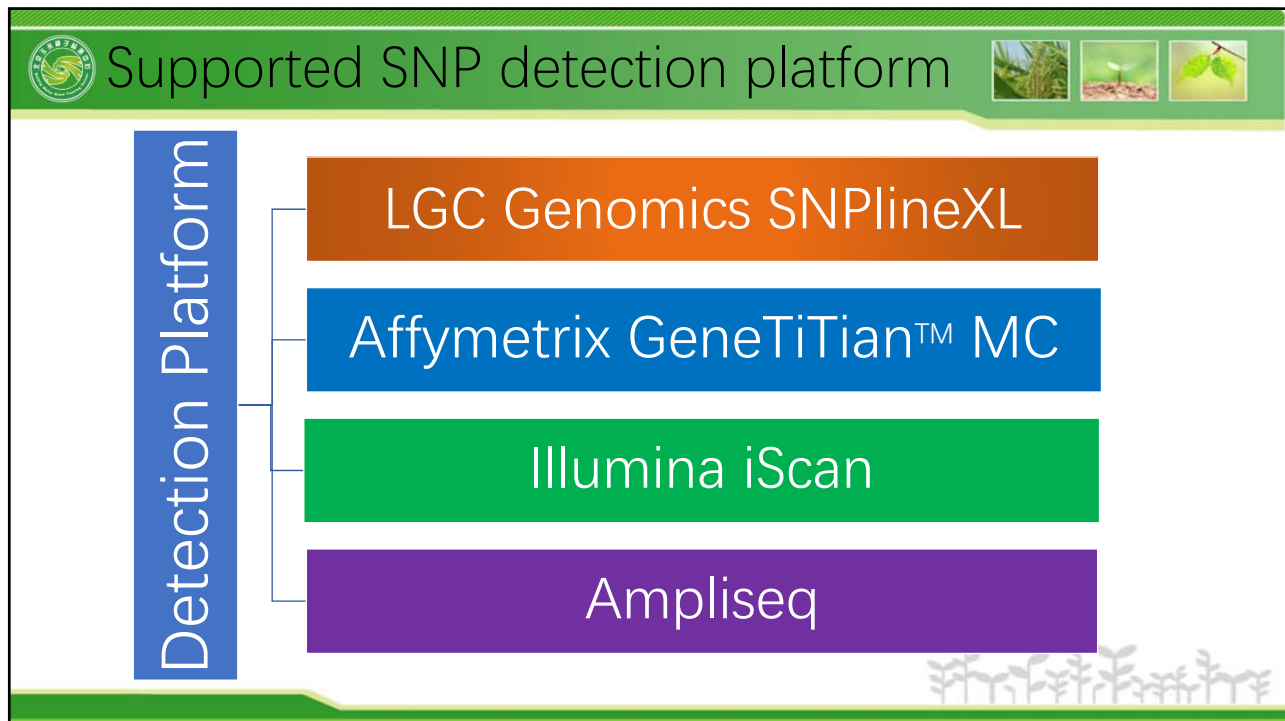
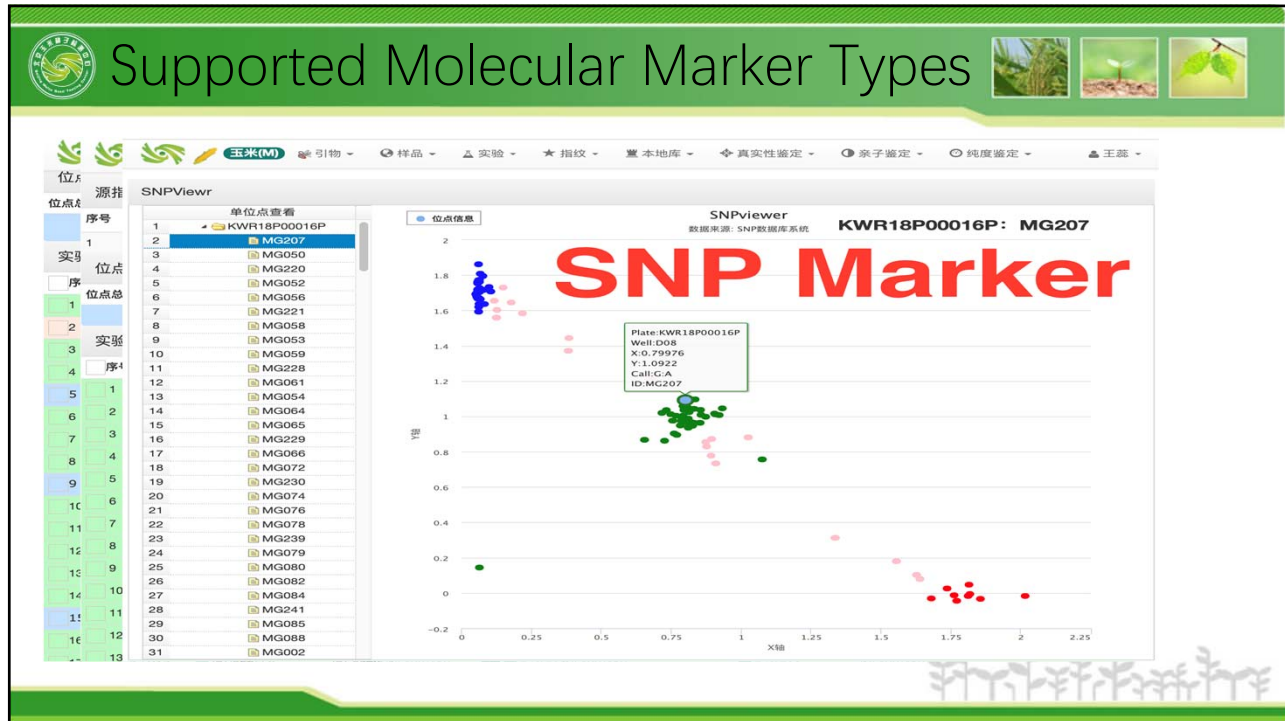
Features

The diagram illustrates the features of the SSR DNA DBMIS system. At the center is a large orange circle labeled "SSR DNA DBMIS". Surrounding it are five smaller circles, each representing a feature: A (Purity), B (All Plant Species), C (Multi-mark: SSR/SNP/INDEI), D (Authenticity), and E (Paternity). These circles are connected by a blue circular line. There are also three small plant icons in the top right corner and a row of stylized plant icons at the bottom right.


Supports All Plant Species

The screenshot shows a software interface for "水稻" (Rice). A "物种分类" (Species Classification) dropdown menu is open, displaying a list of plant species. The list includes: 玉米(M), 水稻(R), 牧草(G), 小麦(W), 大豆(S), 白菜(B), 西瓜(X), 黄瓜(H), 番茄(F), 高粱(L), 茄子(Q), 葡萄(P), 柑橘(G), 菊花(J), 棉花(C), 谷子(G), 辣椒(L), 辣椒(G), 甜椒(S), 结球甘蓝(H), 球莖甘蓝(K), 结球白菜(H), 不结球白菜(NH), and 花椰菜(C). A green arrow points to the "物种分类" dropdown menu. The text "Supports All Plant Species" is overlaid in orange on the screenshot.

| 序号 | 样品来源 | 引物编号 | 本地指纹数据库 | 操作 |
|----|--------|------|---------|---------|
| 1 | 农研中心样品 | RP01 | | |
| 2 | | RP02 | | 125/140 |
| 3 | | RP03 | | 103/103 |
| 4 | | RP4 | | 105/117 |
| 5 | | RP05 | | 145/161 |
| 6 | | RP6 | | 104/122 |
| 7 | | RP7 | | 136/155 |
| 8 | | RP08 | | 163/169 |
| 9 | | RP9 | | |
| 10 | | RP10 | | |
| 11 | | RP11 | | 124/128 |
| 12 | | RP12 | | 246/252 |
| 13 | | RP13 | | 14/150 |
| 14 | | RP14 | | 176/176 |
| 15 | | RP15 | | 143/160 |
| 16 | | RP16 | | 167/170 |
| 17 | | RP17 | | 157/157 |



Supported DNA Analyser




FSA format ONLY


ABI Analyser

- 3100 (4 channels)
- 3500 (8 channels)
- 3100XL (16 channels)
- 3500XL (24 channels)
- 3730 (48 channels)
- 3730XL (96 channels)


- 1 Create Electrophoretic plate automatically online
- 2 Export ABI DNA Analyser Configuration file
- 3 All models of ABI analyser compatible



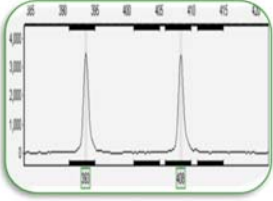
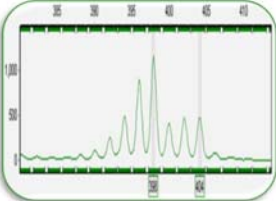
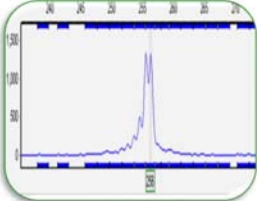
SSR Fingerprint Analyser



SSR 指纹分析器
SSR Analyser



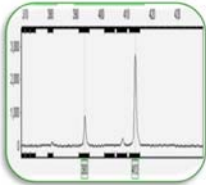
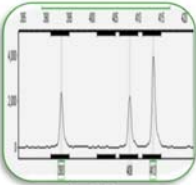
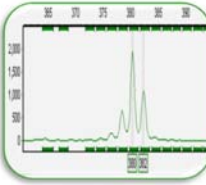
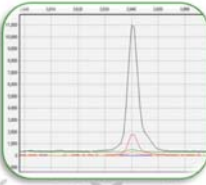
Auto process special peaks

正常峰
Normal peaks

连续峰
Successive peaks

N+1峰
N+1 peaks

高低峰
High and low peaks

多峰
Multi-peaks

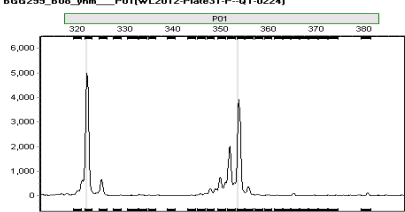
邻峰
Adjacent peaks

Pull-up峰
Pull-up peaks

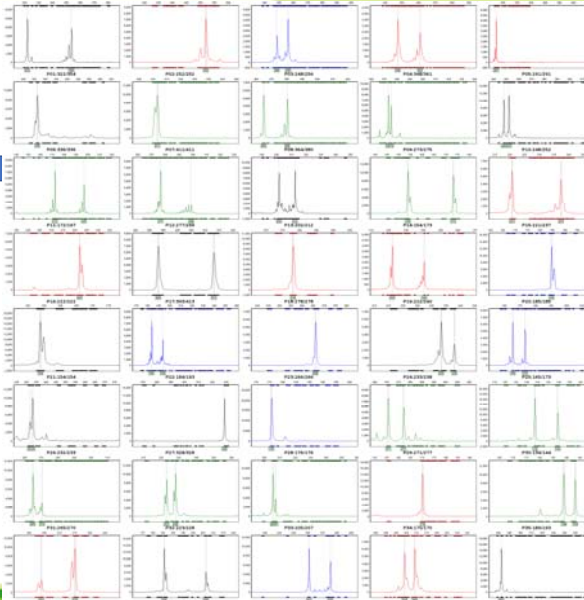
Standard DNA fingerprint

Hybrid Zhengdan958

BGG299_B08_yhm_P01 (wL2012-Plate31-P-Q1-0224)




←



| Allele Label | Size | Height | Score |
|--------------|-------|--------|-------|
| 322 | 322.0 | 4373 | 500.0 |
| 354 | 353.7 | 7062 | 500.0 |

ABI 3730xl



DNA Fingerprint Combination

| ID | Sample Name | Primer | Value 1 | Value 2 | Value 3 | Value 4 |
|----|-------------|-------------|---------|---------|---------|---------|
| 12 | P12 | bnlg1702k1 | 265/267 | 265/267 | -- | -- |
| 13 | P13 | umc1545y2 | 208/211 | 208/211 | 208/211 | -- |
| 14 | P14 | umc1125y3 | 154/173 | 154/173 | -- | -- |
| 15 | P15 | bnlg240k1 | 233/235 | 233/235 | -- | -- |
| 16 | P16 | ph080k15 | 228/228 | 228/228 | 228/228 | -- |
| 17 | P17 | ph065k9 | 393/408 | 393/408 | 393/408 | -- |
| 18 | P18 | umc1492y13 | 278/284 | 278/284 | -- | -- |
| 19 | P19 | umc1432y6 | 230/240 | 230/240 | -- | -- |
| 20 | P20 | umc1506k12 | 178/185 | 178/185 | -- | -- |
| 21 | P21 | umc1147y4 | 154/167 | 154/167 | -- | -- |
| 22 | P22 | bnlg1671y17 | 186/186 | -- | 186/186 | -- |
| 23 | P23 | ph96100y1 | 253/253 | 253/253 | -- | -- |
| 24 | P24 | umc1536k9 | 222/232 | 222/232 | -- | -- |
| 25 | P25 | bnlg1520k1 | 165/165 | 165/165 | -- | -- |
| 26 | P26 | umc1489y3 | 232/232 | 232/232 | -- | -- |
| 27 | P27 | bnlg490y4 | 271/294 | 271/294 | -- | -- |
| 28 | P28 | umc1999y3 | 191/197 | 191/197 | -- | -- |
| 29 | P29 | umc2115k3 | 284/284 | 284/284 | -- | -- |
| 30 | P30 | umc1429y6 | 126/136 | 126/136 | -- | -- |
| 31 | P31 | bnlg249k2 | 263/263 | 263/263 | -- | -- |
| 32 | P32 | ph239652y2 | 240/240 | 240/240 | -- | -- |
| 33 | P33 | umc2160k3 | 205/244 | 205/244 | -- | -- |

DNA Fingerprint Comparison

| Comparison Method | Description |
|-------------------|---|
| Whole DB | Filter the similarity within whole DB |
| Same Name | Filter the DNA with same sample names |
| Suspected | Filter DNA Fingerprint of non-namesake sample |
| In range | Comparison pairwise in selected range |
| Customized | Comparison pairwise with customized criteria |

DNA Fingerprint Comparison

玉米(M) 引物 样品 实验 指纹 本地库 真实性鉴定 亲缘鉴定 纯度鉴定 任洁

位置: / 真实性鉴定 / 全库比对

全库比对条件

最大差异位点数: 5 (0-40)

杂交种

待比样品范围

待比库: 本地指纹库

样品条码号: 模糊查找, 格式:BGG,SFWE | BGG1

对比样品范围

对比库: 本地指纹库

样品条码号: 模糊查找, 格式:BGG,SFWE | BGG1112

比对 重置

注意: 只有已审核(正式审核或临时审核状态)指纹才能参与比对!



Promotion (China)

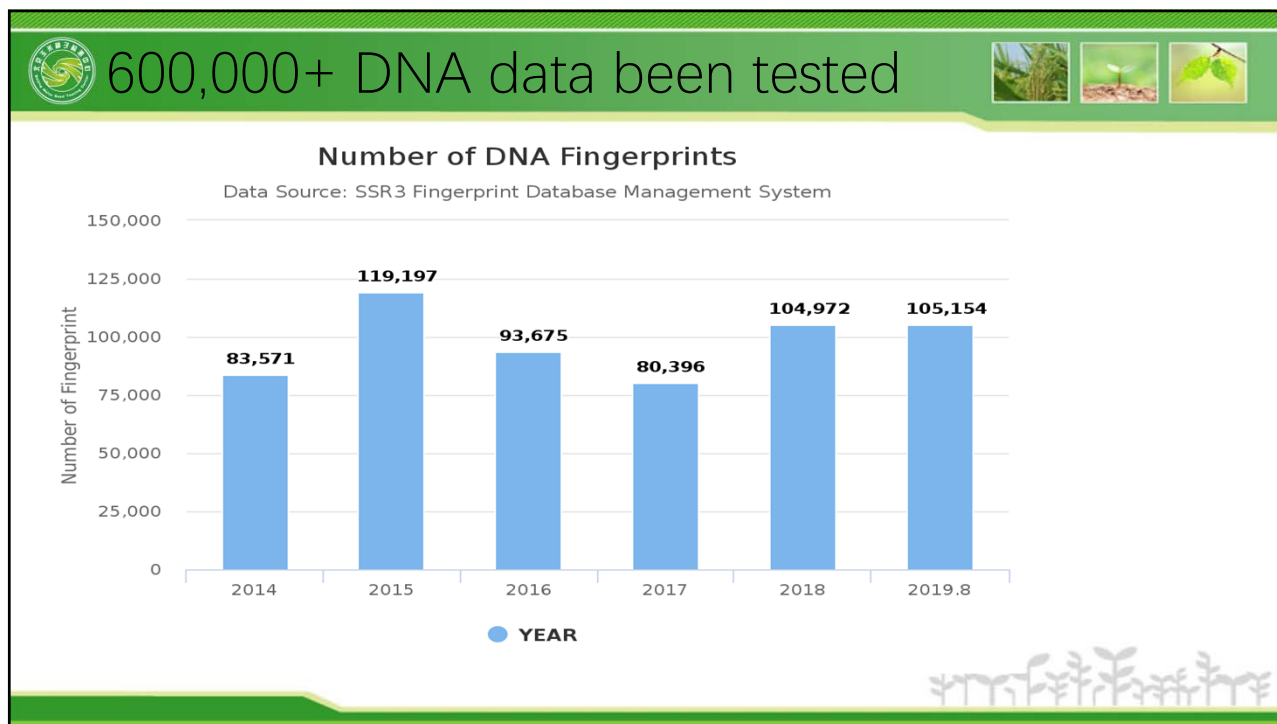
北京市农林科学院玉米研究中心 (开发单位)

- 北京市农林科学院小麦中心
- 农业部植物新品种检测中心
- 太原市种子质量监督管理中心
- 杭州中国水稻研究所
- 河南安阳棉花研究所
- 北京通州国际种业科技有限公司
- 甘肃兰州种子质量监督检测中心
- 甘肃临泽种子质量监督检测中心
- 河南郑州种子质量监督检测中心
- 云南种子质量监督检测中心
- 吉林种子质量监督检测中心
- 深圳市农业科技促进中心



北京市农林科学院
北京玉米种子检测中心
Beijing Maize Seed Testing Center
<http://www.maizedna.org.8445/msdcp>





...ATGAC... ACACGCCA... TCGGGGTC... GTCGACCG... TCGT...
...GTGAC... ACACGCCA... TCGAGGTC... GTCAACCG... TCGC...
...GTGAC... ACATGCCA... TCGGGGTC... GTCAACCG... TCGT...
...GTGAC... ACACGCCA... TCGGGGTC... GTCGACCG... TCGT...

Thanks for your attention!

AAGGTTA
ATGGTTA