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## 杂交水稻专题

### 本期导读

#### ▶ 前沿资讯

1. 嵊州市将高起点高标准建设“水稻公园”
2. 展示水稻选育最新成果
3. 水稻“看禾选种”活动启幕 农技人员、种粮大户观摩挑选新品种

#### ▶ 学术文献

1. 线性选择指数在水稻杂交种性能预测中的应用
2. 杂交水稻籽粒接触的分割与计数算法

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## ▶ 前沿资讯

### 1. 嵊州市将高起点高标准建设“水稻公园”

**简介:**浙江省农业农村厅和嵊州市政府十分重视水稻核心基地的建设,从布局和设施等方面给予规划和投入。省、市两级今年以来已共投入1000多万元资金,包括建设田间观景台、道路拓宽硬化、大型电子屏、基地总部大门和围墙改造等基础设施建设。今年上半年嵊州还征用了基地周围200亩土地,扩大了面积,使基地更具整体性。水稻成熟期不一样,水稻性能不一样。要种植好上百个水稻品种,难度可想而知。为此,嵊州市专门成立了农技服务小组,抽调精干技术力量,长驻基地进行农技服务。从春节过后,就开始田间管理,灌水、防虫害、肥水控制等,把好每一个环节。今年基地扩大了种植面积,面积达到500多亩,新品种也比去年增加64个,总数达到410个。今年以来,分8批次种下了不同时期可收割的水稻。嵊州在水稻新品种展示基地建设过程中,注重生态保护,重视绿化美化田园,去年被评定为浙江省“最美田园”称号。有了良好的基础,建设“水稻公园”就有了可能。嵊州农业农村局局长吕勇进介绍说,嵊州借此来打造田园景观,以形成更大的影响力和品牌效应,使之成为国家级水稻新品种核心展示区、国家级水稻高质量发展示范区、国家级水稻文化公园。今年“水稻公园”最有看点的是浙江大学团队和当地农技术人员完成的色彩禾艺术田块。最大一块田有4.2亩,彩稻品种包含粉彩禾、银彩禾、黑彩禾、紫彩禾、黄彩禾、绿彩禾、景观紫、黑壳糯、小微9种。田块左部主体已呈现出稻穗与粮仓,稻穗为嵊州“看禾选种”品牌标识,辨识度高。粮仓造型敦实、上有“丰”字,寓意五谷丰登。中部有“2019”与“ZHE JIANG”字样。上下部为波形纹,象征风吹稻浪的景象,右上方为五星红旗,右下方为盛开的荷花。左右侧观光步道上,可依次近距离多角度方便观赏到各种类型色彩禾。在田园四周及田间道路两旁,种有孔雀草、百日草、波斯菊等多个花草品种。据介绍,田间种植花不仅是美化田园的需要,更是生态种植的需要。有了花草,益虫有了憩息之地,有利于生态系统的建立。为突出水稻文化的特点,基地的水稻博物馆、水稻文化围墙等也在筹划之中。目前,“水稻公园”景观亭子已经建成,通往基地的柏油路已施工完毕,高7.7米的观景台建设完工。登上观景台极目远眺,错落有致的水稻被太阳扶上了一层霞光,纵横交错的路成为四通八达的路网,将稻田分割成整齐的方块。清澈的生态沟渠、艺术花的水稻图案、摇曳的花草,构成了一幅美丽的图案,令人心旷神怡。“水稻公园”在国庆节前将迎来四方宾客。为庆祝第二个农民丰收节,突出喜庆丰收的效果,主办方邀请本地和周边的农民前来参加表演。目前已选定了多支文艺表演队,在水稻大会期间进行表演,向新中国成立70周年献礼。

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### 2. 展示水稻选育最新成果

**简介:**9月27日,2019浙江·长江下游水稻新品种大会暨中国农民丰收节嵊州庆祝活动在嵊州市良种繁育场举行,全面展示了我省水稻新品种选育的最新成果。据悉,嵊州良种繁育场创办于上世纪50年代,早稻产量曾创浙江省农业吉尼斯纪录,2009年百亩方平均亩产达到652.26公斤。从这一年开始,嵊州良种场被列入浙江省省级水稻新品

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种展示基地。此后每年在这里举行全省性水稻品种观摩会。2017年，我省水稻新品种“看禾选种”核心基地落户嵊州甘霖，基地规划面积为400亩。同年，在我市成功举办了浙江水稻新品种大会。2018年，基地列入全国水稻新品种展示示范区之一，承担国家级水稻新品种展示示范任务。3年多来，我市出色完成了水稻新品种展示示范任务，得到了各大科研单位、育种单位和种植大户的一致好评，影响力在不断扩大。2019浙江·长江下游水稻新品种大会，由全国农业技术推广服务中心、浙江省农业农村厅和中国水稻研究所共同举办。活动层次更高、辐射范围更广、影响面更大，观摩现场汇集了省内410个水稻新品种，类型多、品质优、抗性好，代表了全省、全国乃至全世界水稻的最高育种水平，既为广大科研育种单位和种子企业提供一个很好的展示平台，又为广大农民朋友选择优良品种提供了一个可看、可学、可交流的直观窗口。

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### 3. 水稻“看禾选种”活动启幕 农技人员、种粮大户观摩挑选新品种

简介：据市农业农村局消息，近日，苏州市2019年度水稻“看禾选种”序幕正式拉开，首站在常熟市农业科学研究所举行特优食味香软米新品种“早香粳1号”现场观摩活动。来自苏州市种子管理条线、乡镇农技部门、现代农业园区、粮食加工企业的相关人员以及种植大户等60余人参加活动。据介绍，“早香粳1号”是常熟市农业科学研究所最新育成审定的“国庆稻”新品种。该品种全生育期127.3天，口感软、食味佳、香味浓郁，籽粒饱满、粒型较大，大面积种植亩产可超500公斤，新米赶在国庆前上市，价格高、收益好，可作为优质大米进行产业化、品牌化开发。观摩会现场，与会人员对“早香粳1号”的田间表现纷纷点赞。近年来，苏州市种子管理部门紧紧围绕“苏州大米”区域公用品牌建设需要，加快了绿色优质高效水稻新品种引进、筛选和示范推广的步伐，本年度在全市共建设五个150亩以上苏州市农作物品种综合测试基地。同时，培育水稻新优品种示范户20余户，按照“四个统一”（统一实施方案、统一技术措施、统一记载标准、统一汇总总结）原则，开展实施了2019年度水稻新品种展示与示范，包括“嘉58”“南粳3908”“南粳晶谷”“常粳18-13”“早香粳1号”等12个水稻新品种，总展示、示范面积5000余亩。市种子管理站相关负责人介绍，随着“早香粳1号”新品种观摩会的召开，苏州市各级种子管理部门组织的“看禾选种”活动将全面启动，今年10月份，将分批次、全覆盖组织乡镇农技人员、种粮大户到各个综合测试基地、新优品种示范方观摩、挑选水稻新品种。

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## ➤ 学术文献

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## 1. Efficiency of linear selection index in predicting rice hybrid performance (线性选择指数在水稻杂交种性能预测中的应用)

简介: Selection index (SI) theory has been applied to predict the net genetic merit, select parents for the next cycle, and maximize the selection response in plant breeding. However, up to now, SI has not been applied to predict unobserved hybrid performance. In hybrid breeding, it is impossible to test every cross, and accurate prediction can help breeders greatly reduce the experimental cost. Traditional genomic selection (GS) targets single-trait prediction, and useful information about other related traits is ignored. With the data set of 575 rice hybrids subjected to the North Carolina mating design II, this information was utilized to develop a linear SI-based GS method to predict rice hybrid for a more accurate and comprehensive selection. Cross-validation results showed that genetic information of a low-heritability target trait such as grain yield could be greatly aggregated from auxiliary traits using SI. When SI was used for directly predicting the target trait, the SI-direct prediction underperformed the traditional genomic prediction in most cases. However, when the SI-direct prediction was combined with the traditional genomic prediction using a suitable weight inferred from the training data set, significantly higher accuracy could be obtained. This method was called as SI-assisted prediction. It provided a promising prediction means for breeding application, which used the phenotypes of auxiliary traits only in the training data set. Additionally, it was found that SI-assisted accuracy increased as the genetic correlation between auxiliary traits and the target trait increased, and high heritability of auxiliary traits could also improve the prediction performance.

来源: Molecular Breeding

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## 2. Segmentation and counting algorithm for touching hybrid rice grains (杂交水稻籽粒接触的分割与计数算法)

简介: The ability to segment and count of touching hybrid rice grains can enable the automatic evaluation of seeding performance. In this paper, an algorithm that separates and counts touching rice grain, which consists of the watershed algorithm, an improved corner point detection algorithm, and neural network classification algorithm, is presented. To reduce the over-segmentation regions caused by the watershed algorithm, wavelet transform and Gaussian filter are first applied to enhance the contrast intensity of grayscale image and to reduce noise, followed by an improved corner point detection algorithm based on adaptive-radius circular template. The over-segmentation regions are identified and merged by detecting whether the end points of the splitting lines coincide with the corner points. Considering that regions of different grain quantity vary in appearance and corner point characteristic, a Back Propagation (BP) neural network classifier is employed to classify the under-segmentation regions into five categories: one grain, two grains, three grains, four grains, and more than four grains. The proposed algorithm was tested on three hybrid rice varieties under different realistic touching scenarios formed in the sowing process. The tests

results showed that the corner point detection algorithm using an adaptive-radius circular template achieved better corner point accuracy than that using a fixed-radius template, and the over-segmentation regions were more accurately merged. For grain regions of different grain quantity, BP neural classifier achieved an average classification accuracy of 92.4%, which was suitable for counting rice grains in under-segmentation regions. The overall segmentation and counting method proposed in this study could achieve an average accuracy of 94.63%, which was verified by manual counting results.

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