

## 不同年代玉米品种干物质积累与钾素吸收及其分配

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## Accumulation and distribution of dry matter and potassium in maize varieties released in different years

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摘要

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**摘要** 为比较我国玉米生产中不同年代大面积推广的不同品种生长发育和干物质积累规律, 及其对钾素的吸收和分配的变化特点, 选择了上世纪50年代至今的6个玉米品种(白马牙、金皇后、中单2号、唐抗5号、农大108和郑单958)为材料, 在田间相同条件下进行研究。结果表明, 与早期品种相比, 现代玉米品种的发育进程慢, 生育期长, 叶面积大, 叶片衰老慢。在大喇叭口期, 不同年代玉米品种的干重无显著差异; 但其后现代品种的生长速率显著增加, 干重积累速率也显著高于早期品种, 其干物质积累高峰出现在吐丝期后, 吐丝期后植株的干物重增加量约等于子粒产量, 表明子粒产量与吐丝期后的干物质积累相关。与干物质积累规律不同, 不同年代玉米品种的含钾量在大喇叭口期就有明显差别, 表现为50年代品种<70年代品种<现代品种。玉米对钾的吸收主要在吐丝期之前完成, 吐丝期后钾素累积速率明显下降, 50年代品种的钾素净增量甚至为负值。子粒中的钾主要来自营养器官的再转移, 从叶片中的转移量尤其多。与早期品种相比, 绿熟型现代品种农大108和郑单958从叶片中转出的钾更多。综上, 不同年代玉米品种的不同点在于, 现代品种的叶面积更大, 吐丝期后生育期更长, 叶片衰老更慢, 有利于子粒灌浆, 形成高产; 相同点在于, 干物质和钾素的累积高峰不同步, 子粒产量主要来自于花后的干物质积累, 而子粒中的钾主要来自于营养器官的再转移。

**关键词:** color: black font-family: 宋体 mso-font-kerning: 1.0pt mso-ansi-language: EN-US mso-fareast-language: ZH-CN mso-bidi-language: AR-SA mso-ascii-font-family: 'Times New Roman' 玉米)" href="#">mso-bidi-font-family: 'Times New Roman'">玉米 品种更替 干物质积累 叶片衰老 钾素吸收与分配

**Abstract:** In order to compare the differences in growth, development and dry matter accumulation, as well as potassium (K) uptake and distribution in different maize varieties released in different years in China, field experiment was conducted under the same conditions and six maize cultivars released from the 50s in last century until now were employed, e.g. Baimaya, Jinhuanhou, Zhongdan 2, Tangkang 5, Nongda108 and Zhengdan 958. The result showed that new varieties had slower developmental process, longer growth duration, larger total leaf area and slower leaf senescence, compared with those of the old varieties. At V10 stage, there was no difference in plant dry weights among different maize varieties. After this stage, however, new varieties grew quicker and their dry weights increased faster than those of the old varieties. The high rate in dry matter gain of all varieties appeared after silking. The grain dry weights of all varieties were about the same as the dry matter gains of whole plants after silking, indicating that dry matter accumulated in grains was directly from the leaf photosynthesis after silking. In spite of the same plant dry weights at V10 stage, K contents in maize varieties released in different years already showed difference at this stage, and that was higher in the new varieties than those in the old varieties. Most of K in plants of all maize varieties was taken up before silking. There was even decrease in K content in old varieties Baimaya and Jinhuanhou from silking until maturity. K deposited in grains of different maize varieties came mainly from the retranslocation from the vegetative organs, especially from leaves. There was even more K retranslocated from the leaves of the stray green varieties Nongda108 and Zhengdan 958 than that from the old varieties. In summary, new varieties had longer growth period, larger leaf area and slower leaf senescence, which were beneficial for grain milking and thus higher grain yield formation. Since the high rate in dry weight gain appeared after silking, while the most of K in plants of all maize varieties was taken up before silking, the dry matter and K accumulation in maize plants was not synchronized. Grain dry matter came mainly from the photosynthesis after silking, while grain K came from the retranslocation from the vegetative organs, regardless of the difference in varieties.

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