

莱西市秸秆综合利用现状

Status of Integrated Straw Management in Laixi

莱西市农业机械管理局

Laixi Agricultural Machinery Administration

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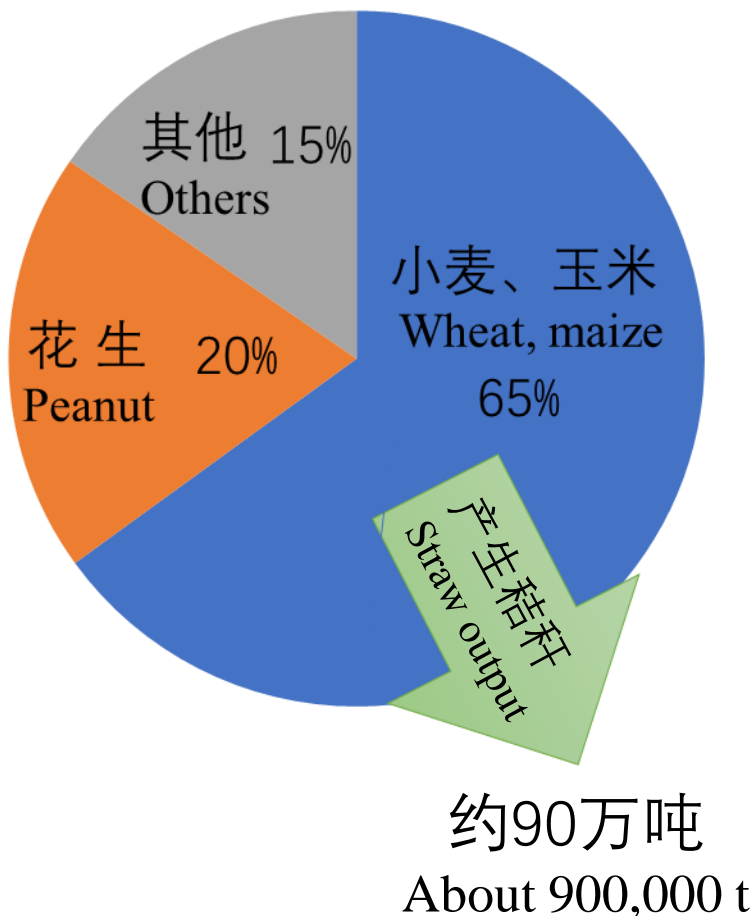
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一、综述 Introduction

莱西市作物占比

Crop planting proportion in laixi



- ◆ 区域：黄淮海麦玉一年两熟区
Region : Wheat-Maize cropping area of Huang-Huai-Hai plain
- ◆ 耕地面积：107万亩
Cultivated area: 71,333 ha
- ◆ 种植模式：小麦(60万亩)、玉米(70万亩)、花生(23万亩)
Cropping pattern: wheat (40,000ha), maize (47,000ha), peanut:15,300ha
- ◆ 秸秆（含青贮）：90万吨
Straw output (including silage): 900,000t

经过市政府连年大力落实秸秆禁烧，以及各级政府财政投入对青贮机、秸秆还田机、秸秆打捆机、小麦免耕播种机进行累加补贴，促进了秸秆综合利用机械的推广和普及。目前我市小麦秸秆除离田用于生物质发电的以外，其余秸秆基本全量还田。玉米秸秆除青贮离田外其余秸秆基本能通过秸秆饲料化全部消耗掉。



但是莱西市又是一个养殖大市，目前全市畜、禽存栏量为**奶牛7.86万头、肉牛1.8万头、羊5.3万只、家禽2792.1万只**，各类畜禽粪便的处理是一个严峻的问题。

Straw burning is forbidden in Laixi recently years. Local government has provided subsidy for various agricultural machinery, such as silage maize harvester, straw returning machinery, straw baling machine and wheat no-tillage seeder, which promotes the application and extension of straw treatment machines. Nowadays, part of the wheat straw is used for power generation, and the rest of the straw is returned to the field. For maize straw, most straws are returned to field directly except for ensiling. Peanut straws are consumed by converting into fodder. However, Laixi is a large breeding market with about **78,600 cows, 18,000 beef cattle, 53,000 sheep and 27.921 million poultry**. Consequently, poultry manure has been a serious problem.



秸秆焚烧
Straw burning



污水横流
Sewage



城市雾霾
Urban haze



秸秆乱堆乱放
Straw placement randomly

秸秆量如此巨大、难以处理，以往的处理方式往往是简单的焚烧、乱堆乱放。畜禽粪便乱堆、乱放，一下雨污水横流，造成了严重的大气污染、水污染

There is a large amount of straw and difficult to handle. The previous treatment was incineration or dumping randomly, which lead to **serious air pollution and water pollution.**

- 近几年来我市探索出**秸秆肥料化、饲料化、基料化、能源化及工业化**秸秆综合利用模式。

In recent years, the city has explored the patterns of straw used as **fertilizer, fodder, base stock, energy resource and industry material**.



饲料化
Fodder



基料化
Base stock

能源化
Energy
resource



肥料化
Fertilizer



工业化
Industry
material

二、秸秆肥料化应用 Straw used as fertilizer

A: 小麦秸秆还田

Wheat straw returning to field

小麦联合收割机加装秸秆破碎器→小麦收获时将秸秆破碎成2-6CM小段→秸秆直接还田→秸秆腐烂后增加土壤有机质减少化肥使用量，增加蚯蚓数量，改良土壤结构的同时起到蓄水保墒的作用。Wheat straw smashed by wheat combine harvester with straw smashing machine to 2-6cm sections and to improve soil structure and amount of earthworm, save chemical fertilizer and reduce evaporation of water.



秸秆离田耕地土壤

Soil without straw returning



连续三年秸秆还田耕地土壤

Soil with three consecutive years of straw returning

B: 玉米秸秆全还田

All maize straw returning to field.

玉米联合收获机→秸秆破碎后直接还田→秸秆腐烂后充当有机肥

Maize straw was smashed by maize combine harvester to return the field and acted as an organic fertilizer after straw rot.



秸秆全量还田
All straw returning



免耕播种机播种
No-till seeder sowing



宽苗带小麦出苗
Wheat emergence with wide seedling

C:玉米秸秆过腹还田

Maize straw-rumen-cattle dung returning

玉米联合收获机→青贮→发酵→饲料喂牛→产生牛粪→牛粪还田

Corn combine harvester → Silage → Fermentation → Feed feeding cattle → Produce cow dung → Cattle manure returning

玉米秸秆青贮
Maize straw silage



青贮池储存发酵
Fermentation



牛粪抛洒车
Cattle dung to field



喂牛
Feeding

三、秸秆饲料化应用 Straw used as fodder

玉米青贮机收获全株 → 秸秆封存发酵 → 发酵后的秸秆喂牛

Silage → Fermentation → Feeding



玉米全株粉碎
Maize straw smashing



秸秆青贮
Silage



喂牛
Feeding

四、秸秆基料化应用 Straw used as base stock

小麦秸秆、玉米秸秆、花生皮、棉籽皮粉碎后混合用不同的比例配比后→压实装袋制成菌棒→室温控制、浇水等日常管理→出菇→采摘

Mixture the wheat and maize straw, peanut skin, cottonseed skin with different ratio → Bacteria sticks produce → Room temperature control, watering and other daily management → Mushrooming → picking



莱西市院上镇崔家庄村秸秆基料化应用蘑菇基地建设正在进行中。

The construction of mushroom base for straw used as base stock in Cuijiazhuang Village, Yuanshang Town, Laixi City is underway.

秸秆粉碎搅拌原料

Straw crushing and raw materials stirring



填装制成菌棒

Production of mushroom stick



采摘
Picking



出菇
Fruiting

五、秸秆能源化应用 Straw used as resource energy

A. 秸秆喂牛→收集牛粪发酵→产生沼气→供居民日常生活使用

Feeding with straw→Fermentation→Produce biogas→ utilization

B. 小麦、玉米收获→秸秆离田→秸秆生物发电

Wheat, maize harvest→straw collection → straw bio-power generation



志涛农机专业合作社对600m³沼汽基础设施建设正在进行中。

Qingdao Zhitao agricultural machinery specialized cooperative is working on the construction of 600m³ biogas infrastructure.



青岛琦泉生物质发电有限公司总投资5.4亿元，一期工程已实现并网发电，每年可实现年发电量3.08亿千瓦时，提供绿色电力2.82亿千瓦时。二期工程预计2019年开工建设，项目投产后预计年燃用秸秆33.6万吨，实现年节约标煤16.8万吨。

Qingdao Qiquan Biomass Power Generation Co., Ltd. has a total investment of 540 million yuan. The first phase of the project has achieved grid-connected power generation and can achieve annual power generation of 308 million kWh and provide green power of 282 million kWh. The second phase of the project is expected to start construction in 2019. After the project is put into operation, it is estimated that the annual burning of straw will be 336,000 tons, and the annual saving of standard coal will be 168,000 t.

六、秸秆工业化应用 Straw used as industry material

农作物去穗存秸秆→秸秆初步处理→加工成草编制品（草帽、手提袋等）

Straw collection → Preliminary treatment of straw → Straw products



七、存在问题 Problems

1. 秸秆饲料化过程中存在秸秆封存**发酵效果差**，取料、投料**机械化程度低**。

In the straw used as fertilizer , effect of straw storage and fermentation were poor and the degree of mechanization of material feeding and feeding were low.

2. 秸秆肥料化示范试验过程中示范基地**面积少、配套机具有待改进**。

During the demonstration test of straw used as fertilizer, the demonstration base areas was small and the supporting machine has to be improved.

3. 秸秆资源化利用过程中的**设备投入**等问题需解决。

Problems such as equipment investment in the process of straw used as resource energy need to be solved.

七、存在问题 Problems

4. 秸秆基料化利用中各种秸秆堆放场地、秸秆的破碎机械化、流水作业的相关机械配套等问题有待解决。

The problems of various straw storage sites, crushing mechanization of straw, and related mechanical equipment for flowing process in straw used as base stock need to be resolved.

5. 对以上各种秸秆综合利用模式的具体示范试验需要配备专业性的技术指导人员。

Specific demonstration tests on the above integrated straw management models of straw need to be equipped with professional technical instructors.

目前我市对以上几种秸秆综合利用方式还没有形成规范化的技术模式，借此联合国可持续农业机械化中心这个项目落户中国青岛莱西市的机会、利用这三年的时间，借助中国农业大学保护性耕作技术装备创新团队的技术指导，在青岛市农机局以及莱西市委市政府的大力支持下，对秸秆综合利用进行系统化、规模化的推广。

At present, Laixi has not yet formed standardized technology modes for the above utilization patterns of integrated straw management. We hope to take this opportunity that CSAM demonstrated the pilot in Laixi, Qingdao to promote systematic and large-scale application and extension of integrated straw management in the next three years with technological guidance from Conservation Tillage Research Centre, China Agricultural University and strong support from Qingdao Agricultural Machinery Administration and Laixi Municipal People's Government.

A field of tall, golden-brown grass under a pale, overcast sky. Several human-like figures are scattered across the field, constructed from woven straw or reeds. The figures vary in size and pose. One large figure on the right stands with its arms raised, holding a long wooden staff with a red cloth draped over it. Another large figure on the left is leaning back, holding a long, hollow, conical object. In the center, a smaller figure is captured in a dynamic, dancing-like pose, also with a red cloth. Other smaller figures are visible in the background, some standing upright and others in various poses. A large, semi-transparent green rectangular box is centered over the middle of the image, containing the word "Thanks!" in a bold, black, sans-serif font.

Thanks!