

今天，你需要知道袁隆平的杂交水稻有多厉害！

Today, you need to know how powerful Yuan Longping's hybrid rice is!

杂交水稻之父袁隆平逝世，享年 91 岁。

China's 'Father of Hybrid Rice' Yuan Longping, dies at 91

老人家一辈子都为中国人的吃饭问题操心，是位真正的耕耘者。

This elderly man has been worrying about the Chinese people's food all his life, and he is a real cultivator.



深刻缅怀袁隆平爷爷！

Deeply cherish the memory of Grandpa Yuan Longping!

今天，混子哥想说说杂交水稻，以此悼念老人家。

Today, Stone (Chen Lei) wants to talk about hybrid rice to mourn the elderly.

这个他奉献一生的事业，让我们不再为饿肚子犯愁。

This career that he dedicated his life to, let us no longer worry about hungry.

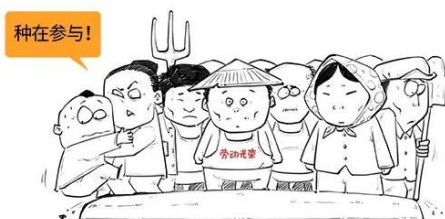


故事还要从上世纪说起。

The story starts from the last century.

那时候咱们农业技术落后，人越来越多，但耕地面积就那么点儿。

At that time, Chinese agricultural technology was backward, and there were more and more people were born, but the area of arable land was only that small.



(everybody participate in planting!)

很容易吃不饱有木有？但是耕地又不像魔术，可以变出来，  
想吃饱，只能提高粮食产量，咋提升呢？

这时袁隆平爷爷站出来了。

In such case, it is easily to get hungry, isn't it? But farmland is not like magic, which can be make it up by magic.

If you want to be full, you can only increase food production. But how?

At this time, Yuan Longping stood up.



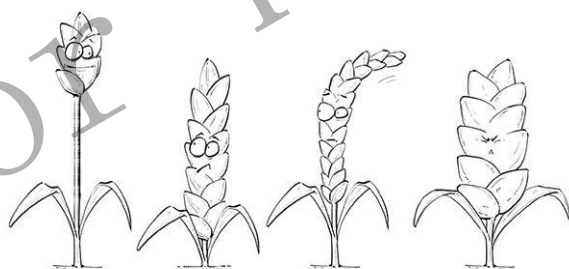
(Try hybrid rice!)

杂交水稻怎么提升产量？

How to increase the yield of hybrid rice?

在那个年代，你如果把水稻们挨个拎出来就会发现，其实大家长得各有各的倔强，比如有的杆长，有的杆短，有的穗大，有的粒粗。

In those days, if you picked up the rice one by one, you would find that everyone actually grew up with their own stubbornness. For example, some had long stems, some had short stems, some had large ears, and some had thick grains.



有的杆长 有的杆短 有的穗大 有的粒粗

假如，我们让穗大的水稻，跟隔壁粒粗的水稻结合下，那下一代是不是就长得既穗大又粒粗？  
不同品种之间的交配，就叫杂交。

它们的后代，可以同时具备父母各自的有点，甚至还会更、加、强大！

If we combine the rice with big ears with the rice with thick grains, will the next generation grow up with big ears and thick grains?

The mating between different species is called crossbreeding.

Their offspring can have the advantages of their “parents” at the same time, and they will even be more, stronger, and stronger!

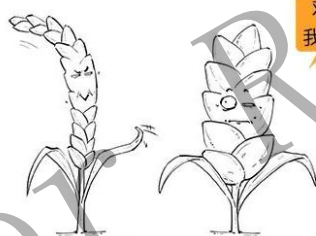


生物学上，管这种现象叫杂种优势！

Biologically, this phenomenon is called heterosis!

但是，这是也没那么容易。你以为，把两个品种种一块，它们就杂交了？

However, this is not so easy. Do you think that if you plant two varieties together, they will cross?



(Sorry we don't know each other)

交配，是让花的雄蕊和雌蕊配种，但是，如果你打开一朵稻花，你会发现，它是雌雄同体！

Mating is to mate the stamens and pistils of the flower, but if you open a rice flower, you will find that it is hermaphrodite!



(stamen on the left and pistil on the right)



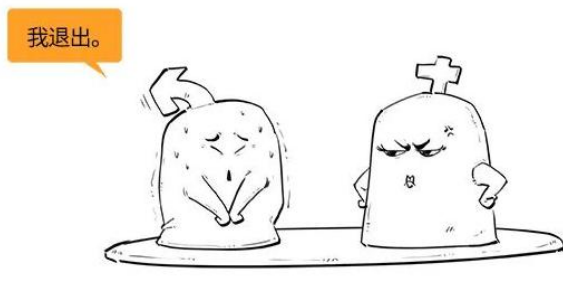
如果不管，青梅竹马就自己交配了。生物学上叫自花授粉，也就是自己生自己。

If you don't take care of it, the rice will mate by itself. Biologically it is called self-pollination, which is to give birth to oneself.

任由这样自花授粉，根本没法跟别的水稻杂交，  
所以，杂交第一步，就是把家里的雄蕊废了……

If you allow self-pollination like this, you can't cross with other rice at all.

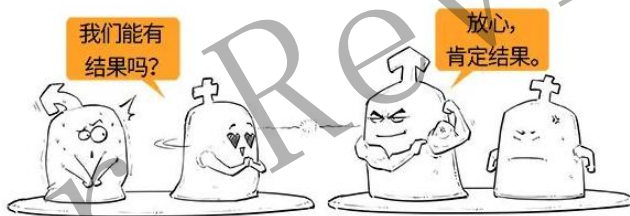
Therefore, the first step in hybridization is to discard the stamens...



(I quit)

天要下雨，娘要嫁人，自家雄蕊靠不住，那就只能找隔壁帮忙。

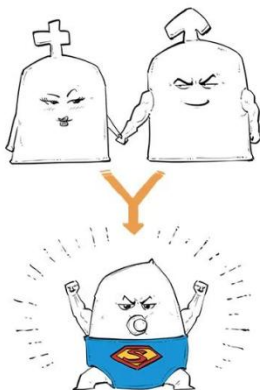
Just let it be. Your own stamen is unreliable, you can only seek next door for help.



(Don't Worry, we will borne rich seeds)

经过隔壁大哥日以继夜的耕耘，杂交水稻的下一代种子……超级杂交稻就诞生了！

After farmer's hard work day and night, the next generation of hybrid rice seeds... super hybrid rice was born!





这样一下， 那样一下，听起来很简单对吧？

Sounds simple right?

但事实上非常困难，这里只是为了方便你理解，就把简单的过程梳理了一下。

But in fact it is very difficult. This is just to facilitate your understanding, so I have sorted out the simple process.

真实的过程要复杂得多！袁隆平和他的团队，操了多少心，耗了多少脑细胞，流了多少汗，才做成了这件事。

The real process is much more complicated! Yuan Longping and his team worked so hard, consumed many brain cells, and sweated to accomplish this.

有人天真地觉得：有啥难的，把雄蕊废了不就好了吗！

Some people naively think: what's the problem, just discard the stamens!



(Please no...)

可看水稻开花结果的过程：花特别小，开花时间贼短，一朵花就结一粒种子。

You can see the process of rice flowering and fruiting: the flowers are very small, the flowering time is short, and each flower bears a seed.



花特别小，

开花时间贼短，

一朵花就结一粒种子。

就发现要实现这一步，既要技术硬，又要时机好，哪有那么简单？

To achieve this step, it requires both technology and good timing. How can it be that simple?



(Technology is difficult..)

人工除雄蕊太费劲，不划算。

所以，科学家们就一直找一种水稻，它的雄蕊在某些自然条件下，能自己坏掉，后来费劲找到一种敏感型的，特点是：

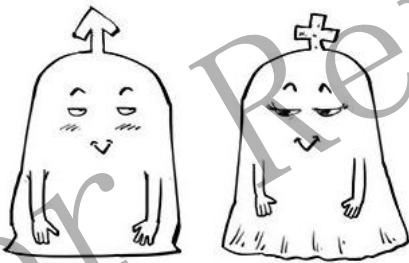
正常气候环境，里面的雄蕊和雌蕊，表现正常，情绪稳定，水稻能正常生长；

Manual removal of stamens is too laborious and not cost-effective.

Therefore, scientists have been looking for a kind of rice whose stamens can be destroyed by themselves under certain natural conditions.

Later, they struggled to find a sensitive type with the following characteristics:

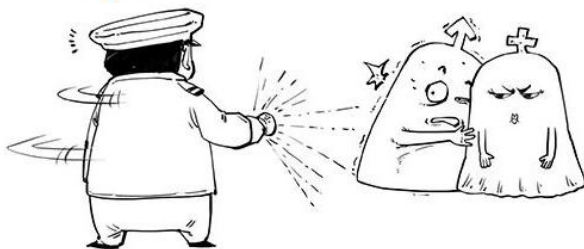
In a normal climate, the stamens and pistils inside are normal, emotionally stable, and rice can grow normally;



但是突然他们被强阳光照到的话，雄蕊就坏掉了。这叫光温敏型核雄性不育。

But suddenly they were exposed to strong sunlight, the stamens would be broken. This is called photothermo-sensitive genetic male sterility.

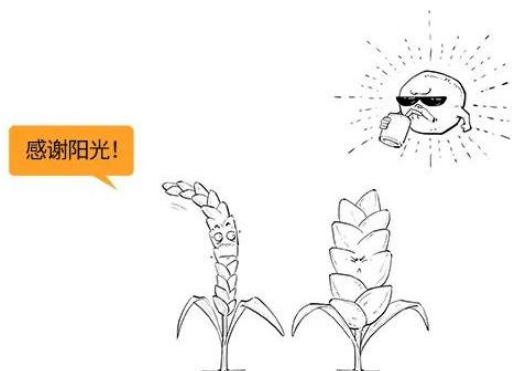
发现你们了!



(Sun: Find you guys!)

这种类型简直完美有木有？可盐可甜，放到光照强的地方，就能杂交了。

This type is perfect, right? Put it in a bright place, you can hybridize.



(Thank you, Sun!)



当然这个例子只是研究杂交水稻路上，其中一个突破，咱们技术一直在进步，科学家不断努力，为的就是亩产突破更高目标，让所有人都吃饱饭。那段记者和袁老的对话，哥始终记得—

Of course, this example is only one of the breakthroughs in the study of hybrid rice. Our technology has been advancing. Scientists continue to work hard to achieve a higher target for yield per mu, so that everyone can eat full. I always remembered the conversation between the reporter and Mr. Yuan:

记者问袁老：六十年代，闹饥荒、讨饭都没得讨，您是不是特别害怕这样的场景再次出现？袁隆平只是淡定地说了四个字：不可能了。

The reporter asked Mr. Yuan: In the 1960s, people were suffering from famine and people even could not begging for anything. Are you particularly afraid of such a scene again?

Yuan Longping only calmly replied: No chance at all.



(No chance at all)



袁老走好！我们一定好好吃饭！

All the way well, Mr. Yuan! We must eat well!

\*Article source: Stone's Wechat Public Account, 2021,  
[https://mp.weixin.qq.com/s/wQ-9KHH\\_JBr-pb3EEV-Sew](https://mp.weixin.qq.com/s/wQ-9KHH_JBr-pb3EEV-Sew)

### About Yuan Longping

Yuan Longping received the 2004 World Food Prize for his breakthrough achievement.



Mr. Yuan Longping at the center stands in a field of hybrid rice in Handan in Hebei Province.

Source: Xinhua News.

According to Xinhua reporter, Mr. Yuan Longping developed a hybrid strain of rice that recorded an annual yield 20% higher than existing varieties — meaning it could feed an extra 70 million people a year. Yuan and his team worked with dozens of countries around the world to address issues of food security as well as malnutrition. Even in his later years, Yuan did not stop doing research. In 2017, working with a Hunan agricultural school, he helped create a strain of low-cadmium indica rice for areas suffering from heavy metal pollution, reducing the amount of cadmium in rice by more than 90%. (Xinhua News Report)



### About Stone (Chen Lei):



Chen Lei (pen name: Er Hun Zi) was the founder of Wechat public account “Hun Zi Yue.” In the past 2 years, Mr Chen or “Stone” as he likes to be called has sold more than 180 million copies. In addition, Chen Lei has 13M fans with hundreds of millions of views in his professionally managed social media accounts (WeChat, Weibo, Douyin, Toutiao).

Drawing inspiration from his industrial design professors, Stone recognized that the most elegant solution to most problems is the simplest one. And Stone has successfully applied this concept to storytelling.

Stone recognized these two converging factors and created a simple formula for satisfying his reader’s endless curiosity. First, he has selected popular topics of the day which range from understanding block chain technologies to a survey of History of China and the History of Tong Poetry.

Stone’s works have been enthusiastically received by readers of all ages. Many young readers discovered Stone from the books that their parents had bought for themselves. By all accounts, it’s a remarkable achievement when a first-time author reaches a best seller list. But what is to be made of a first-time author cornering 9 of the top 30 positions in non-fiction?