新型植物生长调节剂——苯肽胺酸

The mechanism and application technology of phthalanilic acid

CAS RN： [4727–29–1]

中国 西安

Xi`an China

陕西上格之路生物科学有限公司：吴霁阳

Abundant joy come from the choice of quality!

sunger® 上格

Sunger Factory Overall View

R&D

Sunger has about 230 Pesticide Registration Certificates, research and development team contain 50 peoples to ensure our company can supply more than 20 new products annual to the market.

SPECIALITY

We have more than 40 production lines comprehensive cover more than 10 different product formulations, to ensure the production capacity of 10,000 tons per year of our factory.

QUALITY

Strictly control all the aspects from purchase to delivery, ensurance the highly demanding product quality. Got highly praise from customers which come from more than 20 counties around the world.

ECO-FRIENDLY

Sunger has ISO9001(QMS) & ISO14001(EMS) & OHSAS three standard management system, all products comply with FAO and IPM standards and has 146 national patents.

目录-Contents

一、苯肽胺酸基本情况 Basic situation

1998年，化工部西北化工研究院化肥工业研究所完成了苯肽胺酸的合成工艺并委托全国进行了大量的田间试验，取得良好的社会反馈

In 1998 Phenylplycine `s Synthesis Process has been built and deeply field tested by Institute of Fertilizer Industry, Northwest Institute of Chemical Industry, Ministry of Chemical Industry

2002年，新依达（陕西农心前身）获得其独家授权在全国进行推广和销售，在持续十余年的推广和销售中，发现了其在多种作物上的优异表现，所以登记了苯肽胺酸的临时证件，商品名“**宝赢”**

Xin Yi Da (the Predecessor of sunger) got the Exclusive distribution rights in 2002 and during more than 10 years experience ,we found the outperform in the crops andsubmiting the ICAMA with the brand name Bao Ying

一、苯肽胺酸基本情况 Basic situation

2014年，公司决定对苯肽胺酸作用机理进行深入研究，并着手登记原药和制剂

In 2014, Company got the ICAMA for both TC and formulation

2016年，苯肽胺酸与甲氧基丙烯酸酯类杀菌剂在作物上杀菌、增产的组合物获得公开发明专利

In 2016,The patent for sterilizing and increasing yield of phthalanilic acid and methoxy acrylate fungicide on crops

2019年，陕西上格之路在故事系列作物方案中（棉花、小麦、玉米、水稻等）苯肽胺酸销售超300吨，柑橘使用上超过100吨，受到了客户、农户的一致认可

In 2019, sunger sell more than 200MT in the domestic market, especially in the citrus and consensed by customers and farmers

二、苯肽胺酸作用机理研究结论

(委托西北农林科技大学无公害农药研究中心对苯肽胺酸进行了为其5年的研究)

Mechanism of action

(5-years study by Research Center for Pollution-free Pesticide, Northwest A&F University)

1、苯肽胺酸的研究报道
Research report on phthalanilic acid

国内:多数关于药剂残留及安全性的研究，苯肽胺酸属低毒农药，对小鼠生殖细胞无诱变、无致基因突变作用；在黑土中的移动性为可移动，在水稻土和红土中为中等移动，关于苯肽胺酸对农作物生长发育影响的研究较少。

China: Most studies on drug residues and safety, phthalanilic acid is a low-toxic pesticide, no mutagenic or no gene mutation in mouse germ cells; mobility in black soil is mobile, in paddy soil and laterite For medium mobility, there are few studies on the effects of phthalanilic acid on crop growth and development.

sunger 上格

国外: International

➢苯肽胺酸可提高柱头活力，有利于作物授粉，不是生长素，但在生物学效应上与生长素具有协同效应。

phthalanilic acid can improve stigma activity, facilitate crop pollination, not auxin, but has a synergistic effect with auxin in biological effects.

➢在苹果、酸樱桃、甜樱桃、李子等果树上使用苯肽胺酸，能够促进开花、提高果实品质和产量，也有少量在玉米、苜蓿、油菜及向日葵上应用的相关研究报道：经研究表明苯肽胺酸必须应用于**水肥条件充足**的作物

The use of phthalanilic acid in apples, sour cherries, sweet cherries, plums and other fruit trees can promote flowering, improve fruit quality and yield, and also have a small number of research reports on corn, alfalfa, rapeseed and sunflower: studies have shown that phthalanilic acid must be applied to crops with sufficient water and fertilizer conditions

2、苯肽胺酸研究项目四年总结
Four-year summary of the phthalanilic acid research project

本研究以辣椒、豇豆为**供试植物**，测定苯肽胺酸不同浓度处理对辣椒植株生长生理、逆境生理及产量与品质的影响，明确其对作物的生物学效用，以初步揭示其作用机理。主要研究结果总结如下：

In this study, pepper and cowpea were used as test plants to determine the effects of different concentrations of phthalanilic acid on growth physiology, stress physiology, yield and quality of pepper plants, and to determine their biological effects on crops to reveal their mechanism. The main findings are summarized as follows:

（1）苯肽胺酸可促进辣椒植株生长，尤其可增加开花数和延长开花期。温室和大田试验表明，与空白对照相比，30 mL/亩 苯肽胺酸处理辣椒株高相对生长速率和茎粗净增长量均有显著提高。

phthalanilic acid can promote the growth of pepper plants, especially the number of flowering and the flowering period. The greenhouse and field experiments showed that compared with the blank control, the relative growth rate and net growth of stem diameter of the 30 ml/mu phthalanilic acid treated pepper were significantly increased.

（2）苯肽胺酸喷施处理后，辣椒豇豆的光合作用明显增强。叶片净光合速率在生长旺期比空白对照升高明显，叶绿素含量也有显著提高。

After spraying with phthalanilic acid , the photosynthesis of capsicum was significantly enhanced. The net photosynthetic rate of leaves increased significantly during the growth period compared with the blank control, and the chlorophyll content also increased significantly.

（3）苯肽胺酸可诱导辣椒、豇豆植株提高抗逆性。30 mL 苯肽胺酸处理后，温室和大田辣椒的丙二醛含量下降，SOD、POD和CAT活性，类黄酮、总酚以及游离脯氨酸含量得到提高。大田豇豆的抗逆结果与辣椒的一致。

Phenylalanine can induce the stress resistance of pepper and cowpea plants. After treatment with 30ml of phthalanilic acid , the malondialdehyde content of greenhouse and field pepper decreased, SOD, POD and CAT activities, flavonoids, total phenols and free proline content were increased. The resistance of Kidney Bean is consistent with that of pepper

（4）苯肽氨酸处理能够提高辣椒叶片的IAA（生长素）和ZT (玉米素)含量，降低ABA（脱落酸）含量，但对GA_3（赤霉素）含量无明显影响。

phthalanilic acid treatment can increase the content of IAA (auxin) and ZT (zeatin) in pepper leaves, and reduce the content of ABA (abscisic acid), but has no significant effect on GA3 (gibberellin) content.

（5）提高辣椒、豇豆产量。在20、30 mL/亩下，苯肽胺酸具有明显增产效应。辣椒（37%），豇豆（17%）。

Increase the yield of pepper and cowpea. At 20 and 30 mL/mu, phthalanilic acid has a significant yield-increasing effect. Pepper (37%), cowpea (17%).

（6）改善辣椒、豇豆果实品质。苯肽胺酸处理辣椒、豇豆的外观品质得到一定的改善；内在品质：辣椒的维生素C、可溶性蛋白、可溶性糖、辣椒素含量较空白明显提高，豇豆品质的结果与辣椒的相似。

Improve the quality of pepper and cowpea fruit. The appearance quality of phthalanilic acid treated pepper and cowpea was improved. Intrinsic quality: the content of vitamin C, soluble protein, soluble sugar and capsaicin in pepper was significantly higher than that in blank. The quality of cowpea was similar to that of pepper.

（7）与空白对照相比，在蕾期、花期和果期，苯肽氨酸处理供试作物植株的IAA（生长素）和ZT (玉米素)含量分别提高了4.15%~28.54%和23.41%~253.10%，ABA的含量降低了5.47%~28.97%，但对GA3（赤霉素）含量无明显影响；在蕾期和花期，苯肽氨酸处理植株的IAA/ZT比值降低，在果期升高，而ABA/IAA、ABA/ZT、ABA/GA3的比值在各测定期均降低。

Compared with the blank control, the IAA (auxin) and ZT (zeatin) contents of the phthalanilic acid -treated plants increased by 4.15%~28.54% and 23.41%~253.10, respectively, in the bud stage, flowering stage and fruit stage. %, ABA content decreased by 5.47%~28.97%, but had no significant effect on GA3 (gibberellin) content; in the bud stage and flowering stage, the IAA/ZT ratio of phthalanilic acid treated plants decreased, and increased in fruit stage. , while the ratio of ABA/IAA, ABA/ZT, and ABA/GA3 decreased during each measurement period.

3、 相关科研成果 Scientific research results

1、张欧, 马强, 刘娜,等. **苯肽胺酸对供试作物抗逆性及产量的影响**[J]. 农药学学报, 2017, 19(4):449-456.

2、张欧,马强,刘娜,马志卿,张兴. **植物生长调节剂苯肽胺酸对供试作物生长及逆境生理指标的影响**[J]. 西北农林科技大学学报(自然科学版),2018,(08):1-8.

3、吴琼,张荣,李子豪,马志卿,张兴.**苯肽胺酸对供试作物内源激素含量和果实品质及产量的影响**（已投稿，农药学学报）

4、**Effects of phthalanilic acid on growth and development, yield and quality of cowpea（已发表）**

4、结论

- 苯肽胺酸喷施到作物上，通过叶面吸收进入植物体内，改变植物体内的内源激素水平和不同激素间的浓度平衡，促使养分由营养生长向生殖生长转化，从而调节植物的生长发育进程或改变某些局部组织的微观结构。

Phthalanilic acid is sprayed onto crops and absorbed into the plant through leaf surface, which changes the endogenous hormone levels in the plant and the concentration balance between different hormones, which promotes the transformation of nutrients from vegetative growth to reproductive growth, thereby regulating plant growth and development. Process or change the microstructure of some local tissues.

功能：调配植物体内养分流向，解决花芽分化、花朵、幼果等生殖器官在生长发育过程中的养分竞争。
Function: The nutrient flow in the plant is adjusted to solve the nutrient competition in the growth and development of flower bud differentiation, flowers and young fruits.

形象的说，苯肽胺酸就像一个植物营养指挥棒，把植物体内的养分更多地分配给了生殖生长，确保了花芽分化、开花、坐果等生殖生长进程有充足的养分保障。
According to the image, phthalanilic acid like a plant nutrition baton, which distributes nutrients in plants more to reproductive growth, ensuring sufficient nutrient protection for flower bud differentiation, flowering, fruit set and other reproductive growth processes.

sunger
上格

三、苯肽胺酸----营养转运指挥棒

Phenylamino acid----
Nutrient transport baton

1、室内研究和大田推广总结
Summary of indoor research and field promotion

1、营养转运：促进养份从营养生长向生殖生长转运；
Nutritional transport: promote nutrient transport from vegetative growth to reproductive growth

2、保花促授粉：延长花期，提高柱头活力，促进授粉，提高座果率；
Promote pollination: prolong flowering, increase stigma vitality, promote pollination, and increase fruit set rate

3、壮果控梢：促进养份向果实转运，分流（阻隔、阻断）夏梢营养，控旺不伤树；
Strong fruit&control tips: promote the transfer of nutrients to the fruit, divert (block, block) the summer shoot nutrition, control the tree does not hurt the tree.

4、改善品质：用后果个均匀，增加单果重，提升风味和口感；
Improve quality: use even results, increase single fruit weight, enhance flavor and taste

5、缓解大小年：持续使用可调理树势，增加来年花量，缓解大小年
Relieve the size of the year: continue using to adjust trees, increase the amount of flowers in Year-on and Year-off

sunger 上格

2、苯肽胺酸系列产品 Product

sunger 上格

2、苯肽胺酸系列产品 Product

sunger 上格

2、苯肽胺酸系列产品 Product

sunger 上格

2、苯肽胺酸系列产品 Product

sunger
上格

谢谢大家!
Thanks