

РЕЗЮМЕТА

на научните публикации на гл. ас. д-р Николай Велков Велков

В СПИСАНИЯ С ИМПАКТ ФАКТОР

1. Grozeva S, N. **Velkov**. 2014. In vitro plant regeneration of two cucumber (*Cucumis sativus* L.) genotypes: effects of explant types and culture medium. *Genetika*, 46 (2): 485-493. **IF 0,347**

ABSTRACT

The effect of different phytohormone concentrations on callusogenesis and organogenesis in two cucumber genotypes were studied. It was found that the rate of plant regeneration depends on genotype, explant type and culture medium. Hypocotyls were found to be more responsive than cotyledons in morphogenesis. *In vitro* plantlet-regenerants have been obtained in hypocotyls explants on culture medium with 1.0 and 2.0 mgL⁻¹ BA for cultivar Gergana and in 1.0 and 3.0 mgL⁻¹ K – line 15B. Induction of regeneration in cotyledons were established only in cultivar Gergana on culture medium supplemented with 3.0 mgL⁻¹ BA and in combination of 0.5 mgL⁻¹ IAA.

Key words: cucumber, callusogenesis, genotype, plant growth, regulators, organogenesis

2. **Velkov N.**, G. Pevicharova. 2016. Effects of cucumber grafting on yield and fruit sensory characteristics. *Zemdirbyste-Agriculture*, 103 (4): 405-410. **5-year Impact Factor – 0.652**

ABSTRACT

During the period 2014-2015 the effects of cucumber grafting on yield and fruit sensory characteristics were studied under glasshouse conditions. Three long type parthenocarpic cucumber cultivars were grafted on five cucurbit rootstocks. The aim of the study was to compare the yield, elements of productivity and fruit sensory characteristics in order to establish the most appropriate scion/rootstock combinations. The highest yield was recorded in combination cv. Kiara F₁ grafted on *C. maxima* × *C. moschata* F₁. Rootstocks of *Lagenaria* and *C. maxima* and control variants showed great earliness of cucumber scions. *C. maxima* × *C. moschata* F₁ rootstock induced the highest fruit number per plant. The effect of rootstock on fruit quality showed a significant variation in the value of sensory traits appearance, aroma, taste and total sensory evaluation depending on the scion and rootstock combinations. *C. maxima* × *C. moschata* F₁, *Lagenaria* and *C. maxima* rootstocks demonstrated good compatibility with studied cucumber cultivars. The choice of combinations between scion cultivar and rootstock species should be determined after preliminary studies of both components.

Keywords: appearance, *Cucumis sativus*; fruit number; fruit weight; taste, texture

В СПИСАНИЯ С ИМПАКТ РАНГ

3. Pevicharova G., N. Velkov. 2007. Sensory analysis of cucumber varieties at different harvest times. I Salad cucumbers. *Journal of Central European Agriculture*, 8 (1): 25-32. **SJR 0.124**

ABSTRACT

During the period 2001-2002 sensory analysis of six salad cucumber varieties was carried out. The aim of this experiment was to assess the influence of the harvest time on the fruit sensory properties. Flesh colour was the most stable character while appearance, skin colour, aroma, texture, taste and total sensory evaluation varied during the three investigated harvest periods. Two-way analysis of variance proved significant effect of the varieties, harvest time and its interaction on all sensory characters. Depending on the harvest time some of the varieties changed their places one toward other by total sensory evaluation. Therefore, it could not be made reliable conclusions of data obtained from one harvest time. The number of harvest times as well as the number of vegetations should be more than one in order to receive more accurate information for sensory characteristics.

Key words: *Cucumis sativus*, harvest time, fruit sensory properties

4. Pevicharova G., N. Velkov. 2009. Sensory analysis of cucumber varieties at different harvest times. II. Pickling cucumbers. *Journal of Central European Agriculture*, 10 (3): 289-296. **SJR 0.144**

ABSTRACT

During the period 2001-2002 sensory analysis of Bulgarian pickling cucumber varieties Toni, Iren and Pobeda was carried out. The varieties had identical parent female breeding line G-3. Fresh and canned fruits were evaluated at three harvest times. It was established that sensory properties of canned fruits cannot be entirely prognosticated from panel test data of the fresh ones. For breeding purposes sensory analysis of pickling cucumbers for processing should be performed using sterilized pickling cucumbers but not only fresh ones. More precise information about visual and gustatory properties of new created lines and hybrids will be obtained by performing of sensory analysis at different harvest times.

Key words: *Cucumis sativus*, canned fruits, sensory properties

5. Velkov N., St. Neykov, P. Chavdarov. 2008. Resistance in *Cucumis sativus* germplasm to causal agents of powdery mildew and downy mildew. *ISHS Acta Horticulture*, 1: 229-234. **SJR 0.269**

ABSTRACT

In order to establish cucumber genotypes resistant to powdery mildew and downy mildew it was tested 94 accessions supplied from Center for Genetic Resources, The Netherlands (CGN). The trials were carried out during 2004-2007 under glasshouse and plastichouse conditions. Resistant reaction to powdery mildew (*Sphaerotheca fuliginea* Poll.) was observed in 28 accessions and to downy mildew (*Pseudoperonospora cubensis* (Berk & Curt.) Rostow) in 16 accessions that possess different fruit type. Three pickling (W 1922, LV 41, Sumter) and eight salad genotypes (Santo, Long Green, Stono, Polaris S, Sc50, Sagami Hanjioro, Poinset DPM, Taichong Mou Gua) responded with combine resistance to both pathogens.

Cucumber germplasm was characterized by type of flowering and fruit morphology. The three groups of accessions can be used in breeding program to develop resistant cultivars. Cluster analysis shows that accessions contain in the first cluster (resistant to powdery mildew and downy mildew) are the most adequate to be parent components for producing new hybrids and inbred lines. Hybrid combinations have to involve parent components that both inbred lines should be resistant to both pathogens.

Key words: cucumber sources, accessions, *Sphaerotheca fuliginea*, *Pseudoperonospora cubensis*

6. Yankova V., N. Velkov, V. Harizanova, A. Stoeva. 2008. Possibilities for control of the South American Leafminer (*Liriomyza huidobrensis*) on cucumbers in greenhouses. *ISHS Acta Horticulture*, 2: 657-663. **SJR 0.269**

ABSTRACT

The South American leafminer *Liriomyza huidobrensis* was established in Bulgaria after 1996 and is among the important pests of cucumber in greenhouses. A study was conducted during 2004–2008 in Maritsa Vegetable Crops Research Institute in Plovdiv, Bulgaria, to evaluate the efficacy of five insecticides to the larvae and adults of the leaf miner, and its preference to 13 cucumber cultivars and lines. The experiments were carried out in a glasshouse and at a laboratory. The efficacy of the insecticides was tested on the larvae four and seven days after application, and on the adults, 24 hours after application. The bio-insecticides from the group of avermectines Lirosekt 2 EC and Vertimec 018 EC showed high efficacy against both the adults and the larvae, Marshal 25 EC from the group of carbamates was highly effective against the larvae 7 days after the treatment, the pyrethroid Talstar 10 EC and the neonicotinoid Picador 20 SL showed high efficacy against the adults. After comparing the number of mines per leaf the cultivars ‘Diva’ (0.45), ‘Polaris’ (2.32) and ‘Odnosteblenii’ (2.57) proved to be the least preferred. The greatest number of mines was recorded on ‘Gergana’ (5.41) and ‘Starozagorski langi’ (5.79). Two parasitoids – *Dacnusa sibirica* and *Diglyphus isaea*, were found to parasitize on the larvae of the leaf miner. The degree of parasitism reached 35.8% in early July and *D. isaea* was the predominant species.

Keywords: *Liriomyza* spp., *Cucumis sativus*, host-plant preference, pest control, parasitoids, greenhouses

7. Masheva S., N. Velkov and N. Valchev. 2013. Synergism between soil and leaf plant protection products in greenhouse cucumbers and their effect on yield and phytosanitary status. *Bulgarian Journal of Agricultural Science*, 19 (5): 990-995. **SJR 0.174**

ABSTRACT

It was studied the effect of chemical and biological plant protection products (PPP) on root rot (*Fusarium* and *Verticilium* root rot) and powdery mildew in cucumber variety Mirey F₁ grown in cultivation facilities in the “Maritsa” Vegetable Crops Research Institute, Plovdiv during the period 2008-2010. The presence and absence of synergism in their action and an influence on the plant productivity was also studied. It was established a high effectiveness against root rot caused by *Fusarium* spp. and *Pythium* spp., in treatment of plants with Previcur 607 SL + Topsin M 70 WP and Trichodermin NPA. The last product results in yield increase with 12,09%. A

synergism in the action of studied soil and leaf PPP was established. The highest effectiveness against powdery mildew was recorded in soil treatment with Previcur 607 SL + Topsin M 70 WP and leaf PPP Collis, Quadris 25 SC, Timorex 66 EC and Timorex gold.

Key words: root rot, powdery mildew, effectiveness, yield

ПУБЛИКАЦИИ В РЕФЕРИРАНИ МЕЖДУНАРОДНИ НАУЧНИ СПИСАНИЯ:

8. Yankova V., D. Markova, G. Velichkov, N. Velkov. 2014. Plant oils for control of cotton aphid (*Aphis gossypii* Glov.) in greenhouse cucumbers. *Turkish Journal of Agricultural and Natural Sciences*, Special Issue, 2: 1565-1568.

ABSTRACT

Botanical pesticides are an alternative of synthetic chemical pesticides for pest control in modern ecological technologies. These products are not a threat for the environment and human health. Plant products have a number of advantages that make them preferable in modern organic agriculture. The range of these products is constantly expanding, which requires the mechanism of their action to be well known. During the period 2013-2014 a number of studies were conducted for establishment of the effectiveness of plant oils from mustard (*Sinapis alba* L.), hemp (*Cannabis sativa* L.) and yarrow (*Achillea millefolium* L.) in concentration 0.5% and 1% against the cotton aphid (*Aphis gossypii* Glov.) in cucumber variety Kiara F₁, grown in greenhouses. Chemical product Mospilan 20 SP 0.0125% (a. i. acetamiprid) was included as a standard. The 1% plant oils from hemp and yarrow demonstrate a good effectiveness (over 90%) to cotton aphid. The highest values of biological activity of the plant oils, included in the study were observed at 5th-7th day after treatment. The good effectiveness shown by the plant oils, gives us another alternative to control this pest in greenhouse cucumbers.

Keywords: *Aphis gossypii*, cucumber, plant oils, effectiveness

9. Masheva St., Ts. Lazarova, N. Velkov, G. Velichkov. 2014. Botanical products against powdery mildew on cucumber in greenhouses. *Turkish Journal of Agricultural and Natural Sciences*, Special Issue, 2: 1707-1712.

ABSTRACT

During the period 2013-2014, studies for establishment of effective alternative means for control of powdery mildew (*Podosphaera xanthii* U. Braun & N. Snish. Comb. Nov. Syn. *Sphaerotheca fuliginea*) on cucumbers grown in greenhouses were conducted. Plant oils of white mustard (*Brassica alba* L.), hemp (*Cannabis sativa* L.) and wild yarrow (*Achillea millefolium* L.) were tested in two concentrations 0.5% and 1.0%. The phytopesticides HF 250 ml/da (extract from dill (*Anethum graveolens* L.) and AlgoVital Plus 0.3% (extract of brown seaweed *Ascophyllum nodosum* (L.) Le Jolis) were also included in this study. The effect of botanical products is compared with a standards Bayfidan 250 EC 0.02% (a.i. triadimenol) and Domark (a.i. tetraconazol 40 g/L) 0.05%. It was established a high efficacy of the studied products compared to that of the standard. Biological activity of Biofa is less expressed. Studied products are suitable for including in organic and integrated systems for control of powdery mildew in cucumber.

Keywords: *Podosphaera xanthii*, *Cucumis*, phyto pesticides, plant oils, effectiveness

ПУБЛИКАЦИИ В НАШИ НАУЧНИ СПИСАНИЯ:

10. Александрова М., Н. Велков. 2007. Резултати от хетерозисната селекция при краставиците (*Cucumis sativus* L.). *Растениевъдни науки*, 44: 399-405.

РЕЗЮМЕ

Днес и през близките години основният метод при селекцията на нови сортове краставици за трите производствени направления ще остане хетерозисният, на базата на майчини линии от женски тип, *gynoeisious*. През последните три десетилетия у нас се създадоха много нови хетерозисни сортове. Признати и районирани за страната са 11 сорта: дългоплодни партенокарпни оранжерийни сортове: Вихра F₁, Лора F₁, Мирей F₁ и Девора F₁; салатни сортове – Гергана и Мидори F₁ и дребноплодни сортове – Победа F₁ толерантен на CMV и Ирен F₁, Калиопа F₁, Тони F₁ и Ида F₁ с висока устойчивост към брашнеста мана. Предстои признаването от ИАСАС на десет нови F₁ хибриди: Миранда F₁, Киара F₁, Мина F₁ и Хрисанта F₁ – дългоплодни партенокарпни сортове; Марина F₁ и Диметра F₁, салатни сортове толерантни на CMV и Крис F₁, Нона F₁ и Нора F₁ – дребноплодни краставици с висока устойчивост на брашнеста мана. На базата на ДН (дихаплоидна) майчина линия е създаден дребноплодния сорт Бисера F₁.

Ключови думи: *Cucumis sativus*, селекция, линии, сортове, хетерозис, мана

11. Velkov N., S. Grozeva, V. Rodeva. 2010. Comparative study of resistance in cucumber and melon lines to causal agents of powdery mildew and downy mildew by *in vitro* and *in vivo* conditions. *Genetics and Breeding*, 39 (1-2): 187-195.

ABSTRACT

Six cucumber lines and four melon lines were used to compare their reaction to powdery mildew and downy mildew by two methods of screening - whole plant (*in vivo* condition) and leaf disc (*in vitro* condition). Significant differences in absolutely value of disease indexes to both pathogens were proved between two tests. Nevertheless, disease index in leaf disc method confirmed the same tendency of reaction as whole plant test. Cucumber lines tested to PM responded as follow: St. langy and L 9 as susceptible and lines DV, 73 508, TG and 2963 as resistant. Melon lines 5-1-2 and K/15-6 reacted as highly resistant and resistant and VK 1-5-5 and Desertan as susceptible. Cucumber lines tested to DM are arranged by their reaction as follow: St. langy and L 9 responded as high susceptible; lines DV and 73 508 as susceptible and lines TG and 2963 as moderately resistant in both tests. In contrast of this susceptible melon lines VK 1-5-5 and Desertan reacted as intermediate in whole plant test but in leaf disc test responded as highly susceptible and susceptible. Nevertheless, distinguished of genotypes by their degree of resistance corresponded between two methods. Leaf disc method allows breeding of resistance to both pathogens to be more efficient.

Key words: *Cucumis*, leaf disc, *Sphaerotheca fuliginea*, *Pseudoperonospora cubensis*

12. Машева С., Н. Велков. 2011. Влияние на растежния регулатор имуноцитифит върху посевните качества на семената, добива и здравния статус на краставици, отглеждани в оранжерии. *Растениевъдни науки*, 48: 543-548.

ABSTRACT

The impact of the multi-purpose stimulator immunotsitofit on germination, germination energy, yield and efficacy of anvil 5 SC against powdery mildew in treatment of cucumber seeds and plants of the variety Vihra F₁ was assessed. It was found that immunotsitofit jointly stimulate seed germination and increase their germination rate. Applied on seeds and during the vegetation in critical phases of cucumber plant development (2-4-th leaf stage, mass flowering and fruiting stage) in combination with foliar fertilizer kristalon results in yield increase up to 126.21% compared to non treated control variant. Index of powdery mildew damage is the lowest in the variant treated seeds and treated plants by scheme + kristalon + anvil 5 SC ($i = 6.00\%$) and the highest one in non treated control variant ($i = 47.24\%$) in 2008. Effectiveness in application of anvil 5 SC ranges from 75 to 87% depending on the treatment scheme.

Key words: cucumber, stimulator, germination, germination energy, yield, effectiveness

13. Велков Н., М. Александрова. 2012. Киара F₁ – Нов сорт оранжерийни краставици. *Растениевъдни науки*, 49: 42-47.

ABSTRACT

The trial was carried out in glasshouse conditions at “Maritsa” Vegetable Crops Research Institute – Plovdiv during 2006-2007 period. It was perform comparatively study between new develop cucumber cultivar Kiara F₁ and the control cultivar Mirey F₁. Kiara F₁ and Mirey F₁ possesses gynoecious type of flowering. Plants form parthenocarpic fruits (fruits can set without pollination).

Biometrical measurements showed weak differences of vegetation period to first fruit set (earliness) between two cultivars. Kiara F₁ formed more vigorous plants which average length 207 cm compare to Mirey F₁ – 181 cm. Average fruit length of Kiara F₁ is 33 cm that is significantly higher compare to cv. Mirey F₁ - 30 cm. These two traits are in relations to the yield.

It was established that the new cultivar exceeds the control in total and regular yields with 23.22% and 21.05%, respectively. The differences are significant at P 1% and P 0.1%. Higher yield of Kiara F₁ is result of increased fruit number per plant (average 32.18) compare to control cv. Mirey F₁ (average 27.49). Dynamic of productivity shows that the yield of Kiara F₁ increases in greater extent during the vegetation period compare to the control cultivar. In the end of the vegetation period cv. Kiara F₁ realized 13787.14 kg/da regular yield compare to cv. Mirey F₁ - 11389.21 kg/da, average for two years. Yield structure demonstrated no significant differences. The regular yield is 87-89% of the total production. The new hybrid is intended for production in greenhouse conditions.

Key words: breeding, *Cucumis sativus*, hybrid, gynoecious, yield

14. **Велков Н.,** М. Александрова. 2012. Мина F₁ – Нов сорт дългоплодни партенокарпни краставици. *Растениевъдни науки*, 49: 48-53.

ABSTRACT

The trial was carried out in glasshouse conditions at “Maritsa” Vegetable Crops Research Institute – Plovdiv during 2006-2007 period. It was performed a comparatively study between new developed cucumber cultivar Mina F₁ and the control cultivar Mirey F₁. The cultivars are characterized with long fruit type (Dutch type), female type of flowering (*gynoecious*) and parthenocarpic formation of fruits (fruits can set without pollination).

Biometrical characterization shows weak differences between studied cultivars. Vegetation period to first fruit set (earliness) of cv. Mina F₁ is shorter (61.3 days) compare to cv. Mirey F₁ (64.0 days). Average plant length of cv. Mina F₁ is 10 cm higher, number of leaves per plant is 0.7 more and fruit length is 2.33 cm longer compare to the control. Nevertheless the differences are not significant.

The new cultivar is superior in total and regular yield to cv. Mirey F₁ by 112%. Higher productivity is mainly due to higher average number of fruits produced per plant - 2.99. The dynamic of regular yield showed that Mina F₁ formed steadily increasing higher yield till the end of vegetation period compare to that of Mirey F₁. In the end of the vegetation period cv. Mina F₁ formed 12861.48 kg/da regular yield compare to cv. Mirey F₁ - 11389.21 kg/da, average for two years. Yield structure of cv. Mirey F₁ and cv. Mina F₁ demonstrated no significant differences. The regular yield is 89% of the total production. The new cultivar is suitable for growing in greenhouse conditions.

Key words: breeding, *Cucumis sativus*, hybrid, *gynoecious*, yield

15. Masheva S., **N. Velkov,** G. Velichkov. 2012. Alternative means and approaches to control cucumber powdery mildew. *Ecology and Future*, 9 (4): 20-25.

ABSTRACT

The experiment was carried out in the “Maritsa” Vegetable Crops Research Institute – Plovdiv, during 2008-2010. It was performed comparatively studies of preparations based on essential oils, mineral oils and plant protection products (PPP). The effect of essential oils from fennel, turpentine, eucalyptus and tansy has been studied in two treatment concentrations– 0.5% and 1%. The analysis demonstrates that there is a differentiated action of the preparations one in relation to another while the influence of year and dose is not significant. The fennel essential oil shows the highest effectiveness while the turpentine and eucalyptus oils lower one. A high effectiveness to powdery mildew demonstrates PPP Anvil 5 SC. The combined treatment with decreased doses from PPP Anvil 5 SC and mineral oil Akarzin is with slighter effectiveness but the values are close to those of PPP. The best and similar action is observed in fennel essential oil, PPP Anvil 5 SC and in the combinations Anvil 5 SC (0,045%)+Akarzin (0,25%) and Anvil 5 SC (0,035%)+Akarzin (0,25).

Key words: *Cucumis sativus*, efficacy, *Podosphaera xanthii*, essential oils, PPP

16. **Велков Н., Г. Певичарова.** 2014. Оценка на устойчивостта към причинителите на мана и брашнеста мана, морфологични особености и сензорни качества на линии дребноплодни краставици. *Растениевъдни науки*, LI (4-5): 30-36.

ABSTRACT

The trial was carried out at “Maritsa” Vegetable Crops Research Institute – Plovdiv, during 2008-2010 period. Eleven small fruit cucumber lines were tested according their response to causal agents of downy mildew and powdery mildew. It was established that line 20-6-4 possessed the highest level of resistance to both pathogens. Line 20-6-4 originates from PI 179676 that possesses high level of resistance to both pathogens. Lines 5551, 2963, 1983G, Gy-14 and 1379G responded as resistant to downy mildew and powdery mildew.

Sensory analysis of the fruits demonstrated that lines 5551, 2963 and 1983G (4.4-4.7) were given the highest total sensory evaluations while line 20-6-4 had the lowest one (3.7).

Correlation analysis revealed strong relations between resistance to downy mildew and powdery mildew ($r=0.961^{**}$ and $r=0.899^{**}$), days to mass flowering and powdery mildew ($r=-0.761^{**}$ and $r=-0.696^{*}$), days to mass flowering and resistance to downy mildew ($r=-0.717^{***}$ and $r=-0.683^{*}$).

The evaluated resistant small fruit cucumber lines can be used in breeding programs as parent components in order to obtained F_1 hybrid combinations with high quality organoleptic traits, resistant to causal agents of downy mildew and powdery mildew.

Key words: cucumber, resistance, mildew, fruit, quality, correlation

17. **Велков Н.** 2014. Проучване компонентите на продуктивността при хибриди дребноплодни краставици чрез корелационен и регресионен анализ. *Растениевъдни науки*, LI (4-5): 37-42.

ABSTRACT

The interrelations between basic components of productivity of 12 small fruit cucumber hybrids by correlation and regression analysis were studied. It was established strong correlations between the yield and fruit number average per plant ($r=0.86-0.99$). Correlation coefficients between yield and average fruit weight differ significantly that depends on fruit size. The correlation is negative in size of fruits 3-6 cm ($r= -0.89$), it is weak in size 6-9 cm ($r= -0.01$) and it is positive in size 9-12 cm ($r=0.66$). The traits of fruit length, fruit diameter and seed cavity diameter possess weak influence on yield. It was calculated linear regression equations that expressed influence of studied traits on yield.

Correlation interrelations between yield received during whole vegetation period (total of 30 harvest times) and yield received during the separate harvests were studied. Correlation was weak between total yield and the yield received from first to fourth harvests ($r=0.43-0.59$). It was established strong correlations between total yield and the yields received from fifth and subsequent harvests ($r=0.66$). It was calculated regression equation that shows relations between total yield and yield received from first to fifth harvests (earliness).

The results contribute for increasing effectiveness of selection for productivity in small fruit cucumber hybrid combinations.

Key words: cucumber, yield, fruits, number, weight, length

18. Masheva S., N. Velkov, N. Valchev, V. Yancova. 2013. Screening of plant protection products against downy mildew on cucumbers (*Pseudoperonospora cubensis* (Berkeley & M. A. Curtis) Rostovzev) in cultivation facilities. *Agricultural science and technology*, 5 (2): 194-199.

ABSTRACT

Screening of plant protection products (PPP) against downy mildew in cucumbers *Pseudoperonospora cubensis* (Berkeley & M. A. Curtis) Rostovzev was carried out during the period 2006-2011 in the "Maritsa" Vegetable Crops Research Institute, Plovdiv. Their toxicity to the imago of the bioagent *Encarsia formosa* Gah. were studied. It was established high effectiveness (over 85,00 %) of the PPP with active ingredients: dimethomorph (Zampro SC, Acrobat paplus SC); symoxanil (Korsate Pro WG, Korsate R DF), strobilurins (Eclair 49 WG, Quadris 25 SC). With the lowest effectiveness to the agent of downy mildew is Timorex 66 EC. All studied products are suitable for including in the systems for control of this disease. Non-toxic products to *E. formosa* is the botanical fungicide Timorex 66 EC, medium toxic product are those containing a.i. strobilurin and propamocarb-hydrochloride. The remaining PPP are slightly or medium toxic to the bioagent. Therefore *E. formosa* could be applied parallel with slightly toxic fungicides against *P. cubensis*.

Key words: effectiveness, toxicity, index of damage, downy mildew, fungicides, *Encarsia formosa*

19. Velkov N., V. Petkova. 2014. Influence of Herbagreen mineral fertilizer on seed production of cucumber, melon and zucchini. *Agricultural science and technology*, 6, (1): 63-67.

ABSTRACT

The effect of Herbagreen mineral fertilizer on seed production of cucumber, melon and zucchini was evaluated. Three times treatment with the fertilizer at a dose of 0.04% at an interval of 14 days has a positive effect on seed yield in the studied cultures. Proven high effect was established in the indicator number of fruit per plant. There were no significant differences between treated and untreated (control) variants at the indicators: number of seeds per fruit, number of seeds per gram, weight of seeds per fruit (g), number of seeds per gram; absolute mass of seeds (g). Increasing the yield of the seed does not have any negative effect on the quality of the seeds. By the worked out regression equations the effect of application of Herbagreen could be foreseen.

Keywords: Seed, yield, quality, *Cucurbits*, fruit, number

20. Velkov N., V. Petkova. 2014. Crops from *Cucurbitaceae* in collection of the Maritsa Vegetable Crops Research Institute, Plovdiv – local cultivars and their application in breeding programme. *Agricultural science and technology*, 6 (2): 134-142.

ABSTRACT

Cucumber, watermelon, melon and squashes are species belonging to the *Cucurbitaceae* family. The breeding of these crops has long tradition in Bulgaria. The created old varieties of cucumbers, watermelons, melons and squashes are subject to variety maintenance in the collections of Maritsa Vegetable Crops Research Institute and have significant participation in the new breeding programs. In this paper the results from study regarding the assessment of genetic resources in *Cucurbitaceae* family (old local cultivars and wild species) are presented. Gene pool in cucumbers comprises twelve old varieties, including: long parthenocarpic type – three, salad – four, and small fruited type – five. Some of these varieties are involved in promising hybrid combinations. The melons were represented by three old local cultivars which are also included in the breeding scheme. In the collection of watermelons we maintain three old local cultivars and with squashes – two. The *Lagenaria*, *Luffa* and a number of wild species are of small importance for the agriculture but they are valuable sources of genetic plasma. The most typical peculiarity of all species from this family is the great polymorphism in respect to the flowering type, plant habit and fruit features. As a result of the performed study morphological, phenological and phytopathological evaluation of the available gene pool of *Cucurbitaceae* family was made using traditional and modern breeding methods with an emphasis on new breeding approaches.

Keywords: Cucurbits species, breeding, variety maintenance, local cultivars, mildew

21. Янкова В., Д. Маркова, Н. Велков. 2014. Скрининг на продукти за растителна защита срещу памуковата листна въшка (*Aphis gossypii* Glov.) при отглеждане на оранжерийни краставици. *Селскостопанска наука*, 47 (1): 35-39.

ABSTRACT

Cotton aphid (*Aphis gossypii* Glov.) (*Homoptera:Aphididae*) is one of the most common pests on cucumbers grown in greenhouses. The susceptibility of population in the greenhouse complex to the insecticides used is different in the particular regions. Rotary application of a broad spectrum of plant protection products is necessary in order to be optimized their use and to avoid the risk of resistance.

The aim of this study was to make a screening of plant protection products for determination of their effectiveness against cotton aphid in greenhouse cucumbers.

Studies have been conducted in the period 2009-2013 under unheated glasshouses in the „Maritsa” Vegetable Crops Research Institute, Plovdiv with cucumber variety Kiara. Trials were conducted under natural attack of *A. gossypii*. Among the included 10 plant protection products was established that very good effectiveness against cotton aphid demonstrate the following ones: Confidor Energy OD 0,06%; Biscaya 240 OD 0,06%; Mospilan 20 SP 0,0125%; Confidor 20 SL 0,05%; Actara 25 WG 0,007% and Nurele Dursban 50 ml/da.

Key words: *Aphis gossypii*, pest control, insecticide, cucumber, greenhouses

22. Арнаудов Б., Хр. Ботева, **Н. Велков**. 2015. Изпитване на биопродукти при оранжерийни краставици сорт Дефенс F₁ в зависимост от средата на отглеждане. *Растениевъдни науки*, ЛП (5): 23-29.

ABSTRACT

The experimental work was conducted with cucumber variety Defence F₁ (Netherland) in 2005-2007 in unheated Venlo type greenhouse in the Maritza Vegetable Crops Research Institute, Plovdiv, Bulgaria. The purpose of the research is to determine the influence of bioproducts on the biological expression and productivity of greenhouse cucumbers, grown as soil and soilless culture. The growth expressions of cucumber variety Defense F₁ are not significantly influenced by the the bioproducts type and the growth media. Identical tendency of leaves formation was found in both growth mediums. In comparison with the soil growth, adding of the bioproducts: Biolife, Biohumus, Trichodermin and Humustim (foliar) to the nutrient regime of the substrate culture proved to increase the first quality production formation (from 18.5% to 42.5%). The highest total yield in Defense F₁ variety is obtained after combined treating with Biohumus and Humustim (9603 kg/da) in soil culture and with Biolife (11 422 kg/da) in soilless culture which exceeded the controls with 25.9% and 23.8%, respectively. In comparison of the two growth mediums it was stabled proven higher yields in the soilless culture after treating with Biolife (36.1%) and Biohumus (29.8%).

Key words: bioproducts, glasshouse, cucumber, yield

23. **Velkov N.**, N. Tomlekova, F. Sarsu. 2016. Sensitivity of watermelon variety Bojura to mutant agents ⁶⁰Co and EMS. *J. BioSci. Biotech.*, 5 (1): 105-110.

ABSTRACT

A study on the sensitivity of watermelon variety Bojura to mutagenic agents was carried out in 2013-2014. The goal was to establish effective doses for mutagenic treatment of dry seeds with ⁶⁰Co gamma rays (80, 100, 200, 250, 350 and 450 Gy) and swollen seeds with water for 24 hours were treated with ethyl methanesulfonate (EMS) at a concentration of 2%. Dominant mutations were not observed in the M₁ generation. Morphological changes in 14 of 1395 M₂ plants were observed. Phenotypic variations changes were the colour of the seed coat, chlorophyll disorders of cotyledons, leaves, petals, and alterations of the location of the fruit set in the central stem. Visible changes of the morphological characteristics of the fruit were not observed. The doses induced certain morphological changes, however, higher doses or combined gamma rays ⁶⁰Co and EMS treatments would induce mutations more efficiently. Subsequent experiments are required to obtain mutants with changes that affect flowers and fruits. The results are important for increasing mutation efficiency in watermelon breeding.

Key words: *Citrullus lanatus*, induced mutagenesis, phenotype

24. **Velkov N.** 2009. Breeding assessment of salad cucumber cultigens. Proceedings of the Second International Conference, Research People and Actual Tasks on Multidisciplinary Science. Lozenec, Bulgaria, 10-12 June, 2009., 1: 63-67.

ABSTRACT

Over 30 breeding lines and varieties (cultigens) were evaluated in greenhouse conditions according their type of flowering, fruit morphology traits, resistance to powdery and downy mildews, term to mass flowering and presence of bitterness. Using cluster analysis it was established large dissimilarities between cucumber breeding materials according their traits. Dendrograme is clustered into two main groups as successive separation of the branches divided genotypes into two subgroups from each one. The subgroup that composes salad lines A5/7-6-7, L-61, 8383, A6/3-1-2, A10/1-12, TG, 73508 and 8360/1 is characterized with short term to mass flowering - 43-45 days, fruit length 24-28 cm, resistance to powdery and downy mildews, with monoecious and gynoecious type of flowering and absence of fruit bitterness. This subgroup composes the most adequate lines for use in breeding hybridization program as parent components.

Key words: *Cucumis sativus*, gynoecious, flowering, fruit, morphology, resistance

25. **Velkov N., M. Alexandrova.** 2010. Study of new F₁ pickling cucumber hybrids, yield and yield components. 45th Croatian and 5th International Symposium of Agriculture, February 15-19, 2010, Opatija, Croatia. 519-523.

ABSTRACT

The aim of this study was to evaluate the yield and its components of new pickling cucumber hybrids. Three F₁ crosses (5551 x T/19, 5551 x P/176 and 2963 x T/19) were developed on the base of two gynoecious mother lines resistant to powdery mildew and downy mildew crossed with two monoecious lines resistant to powdery mildew. The new hybrids could be of great importance for the canning industry. They exceeded the control cultivar by relatively higher 3-6 cm and 6-9 cm (fruit size) yield percentage and formed less oversized fruits. The 5551 x T/19 hybrid produced the highest marketable yield. The differences in marketable and total yield between 5551 x T/19 and 2963 x T/19 crosses and cv. Tony F₁ control were not significant. That was due to the fact that the high yield cv. Tony F₁ control was used for evaluation.

Key words: *Cucumis sativus*, marketable yield, fruit, weight

26. Zsivanovitsl G., G. Pevicharova, **N. Velkov**. 2012. Genotypic response of melon to texture parameters and sensory quality. Proceedings Book, 50 years Food RDI International Scientific-Practical Conference "Food, Technologies & Health", pp 17-22.

ABSTRACT

Texture and sensory attributes of fully mature melon (*Cucumis melo* L.) fruits of three breeding lines grown in two consecutive years were evaluated. Cultivars varied in degree of preference expressed by panelists' ratings for sweetness, texture and overall taste, and for texture parameters (yield force, young modulus, deformation work, rupture force and ratio between rupture and yield force). Some correlations between the sensory and the instrumental parameters are reported. The ratio between rupture and yield force shows a very good connection with the most of the sensory treats. The stability and the importance of parameters are also reported.

Keywords: Yield point; Rupture point; Young modulus; Instrumental parameters; Overall taste; Total sensory evaluation (TSE); Correlation; Fruit harvest index; Breeding lines

27. **Velkov N.**, St. Neykov and P. Chavdarov. 2007. A study on the resistance of introduced cucumber accessions to causal agent of powdery mildew – *Sphaerotheca fuliginea* Poll. under greenhouse and open field conditions. International Scientific Conference "Plant Genetic Stoks – The Basis of Agriculture of Today", 13-14 June 2007, IPGR, Sadovo, Bulgaria, 1: 95-98.

ABSTRACT

During the period 2004-2006 was studied susceptibility of 43 cucumber accessions to causal agent of powdery mildew *Sphaerotheca fuliginea* Poll in greenhouse condition as well as in the open field. It was established that tested cucumber accessions is divided into three main groups after last reading at the stage of harvesting. The first group included 11 accessions, which were resistant to powdery mildew in the field and in the greenhouse conditions. The second group – 12 accessions were resistant in the field but susceptible in the greenhouse condition. The third group – 19 accessions were susceptible in both experiments.

We could explain the reaction of cucumber accessions belong to the second group that microclimate condition in the greenhouse is more favourable to develop as *S. fuliginea* as well as to cucumbers. On one hand the most of cucumber accessions were belong to slicer fruit type which is growing mostly in greenhouses and on the other hand *S. fuliginea* is developing more strong under higher temperature and humidity which are supplying in greenhouse condition. In this case to select resistant breeding material in greenhouse condition evaluation will be more precise then on the open field one. In our previously studies, by testing 10 different isolates of powdery mildew, we established that variation of the susceptibility was expressed greater in susceptible cucumber varieties compare to resistant. Some of the susceptible materials moved more frequently from one group of susceptibility to the other including from intermediate resistant to susceptible one. We suggesting that accessions belong in the second group actually are susceptible and when they fall under the influence of more favorable condition of powdery mildew develop, they moved from intermediate resistant group to susceptible one. These results showed that the selection of breeding material resistant to *S. fuliginea* should be carrying out in greenhouse condition. The

accessions 8628 (Neznaeskij 12) and A 126 (At - 1) were the most suitable source combining resistance to powdery mildew with good fruit quality.

Key words: cucumber, accessions, powdery mildew, *Sphaerotheca fuliginea*

28. Neykov St., P. Chavdarov, **N. Velkov**. 2007. A study of cucumber accessions with different geographical origins for resistance to downy mildew (*Pseudoperonospora cubensis*) and bacteriosis (*Pseudomonas syringae* pv. *lachrymans*). International Scientific Conference “Plant Genetic Stocks – The Basis of Agriculture of Today”, 13-14 June 2007, IPGR, Sadovo, Bulgaria, 1: 99-102.

ABSTRACT

Very important moment after collecting and evaluating of the cucumber accessions is nominated of the perspective as a source material for breeding. A particular important direction in cucumber selection for the last 25 years has been creating of sorts with complex resistance to the diseases. In results of the study are nominated 22 perspective accessions with resistance to the mildew and bacteriosis mainly from Asian origin. Less to the infected from mildew have accessions from Taiwan – Shu Shan, Pin Chung, Asia Chin Chan and bacteriosis – PI 169352 and Balang from Iran.

Key words: accessions, breeding, resistance to the diseases, bacteriosis, field conditions

ДОКЛАДИ ОТ НАЦИОНАЛНИ КОНФЕРЕНЦИИ С МЕЖДУНАРОДНО УЧАСТИЕ

29. Янкова В., Д. Маркова, **Н. Велков**, Б. Арнаудов. 2014. *Aphidius* spp. (*Hymenoptera: Aphidiidae*) в популациите на *Myzus persicae* Sulz. *Aphis gossypii* Glov. при пипер и краставици в оранжерии. Сборник на докладите от X юбилейна национална научно-техническа конференция с международно участие „Екология и здраве”, 5 юни 2014, Пловдив, 217-222.

ABSTRACT

Species of the family *Aphidiidae* are oligophagous or polyphagous. They are distributed in agroecosystem and carry out significant biological regulation of aphids. The purpose of the study was to trace the parasitizing of *Aphidius* spp. in populations of the green peach aphid (*Myzus persicae* Sulz.) and cotton aphid (*Aphis gossypii* Glov.) in pepper and cucumber greenhouse production as an opportunity for biological control. Studies were conducted in the period 2011-2012 in unheated glasshouses at the Maritsa VCRI, Plovdiv in natural population density of pests and parasite in pepper variety Piruet and cucumber variety Kiara. It was established that the beneficial species of the genus *Aphidius* can successfully regulate the density of aphids in agroecosystem as a percentage of parasitism at natural population density of parasites on *M. persicae* reached 67,58%, while on *A. gossypii* - 68,10%. The highest percentage of parasitic aphids was established in the first ten days of July in *A. gossypii* in the first ten days of July and October in *M. persicae*. The results of the conducted observations at natural population density of pests and parasite show that under favorable climatic conditions beneficial species of the genus *Aphidius* can successfully control the population density of aphids.

Key words: *Aphidius*, aphids, pepper, cucumber, greenhouses