EFFICACY OF ADAVELT™ ACTIVE (FLORYLPICOXAMID) AND STROBILURINS AGAINST CHILLI ANTHRACNOSE IN VIETNAM

Huynh Van Nghi*, Nguyen Huu Quang, Ashutosh Bhaik, Amandine Picard, Andrew Leader

Corteva Agriscience

*Corresponding author: huynh.nghi@corteva.com

Received: 02/08/2025 *Revised:* 17/10/2025 *Accepted*: 08/11/2025

ABSTRACT

Field experiments were conducted in the highlands of Vietnam to evaluate the efficacy of a novel picolinamide fungicide, Adavelt™ (florylpicoxamid), and selected strobilurin fungicides against chilli anthracnose. Applications were performed during the fruit development stage at two timings: prior to visible symptom development and after symptom onset (≤1% disease incidence). Florylpicoxamid at 150 g a.i./ha and metominostrobin at 80 g a.i./ha consistently provided effective control of anthracnose during both fruit development and post-harvest storage across application timings. These treatments were followed in efficacy by florylpicoxamid at 125 g a.i./ha, azoxystrobin at 150 g a.i./ha, and picoxystrobin at 150 g a.i./ha. Higher marketable yields were also observed with florylpicoxamid at 150 g a.i./ha (20.41–20.54 tons/ha) and metominostrobin at 80 g a.i./ha (19.70–20.53 tons/ha) compared with other treatments. The results indicate that Adavelt™, containing florylpicoxamid, is a promising option for the management of chilli anthracnose under field conditions.

Keywords: Anthracnose, Chilli, Fungicides, Florylpicoxamid, Strobilurins

HIỆU QUẢ PHÒNG TRỊ BỆNH THÁN THƯ TRÊN ỚT CỦA ADAVELT™ (FLORYLPICOXAMID) VÀ MỘT SỐ STROBILURIN TẠI VIỆT NAM

Huỳnh Văn Nghi*, Nguyễn Hữu Quảng, Ashutosh Bhaik, Amandine Picard, Andrew Leader

Corteva Agriscience

*Corresponding author: huynh.nghi@corteva.com

Nhận bài: 02/08/2025 *Hoàn thành phản biện:* 17/10/2025 *Chấp nhận bài*: 08/11/2025

TÓM TẮT

Các thí nghiệm ngoài đồng ruộng được tiến hành tại vùng cao nguyên Việt Nam nhằm đánh giá hiệu lực phòng trừ bệnh thán thư (anthracnose) trên cây ớt của Adavelt™ (florylpicoxamid) và một số hoạt chất nhóm strobilurin. Thuốc được xử lý ở giai đoạn phát triển trái với hai thời điểm: trước khi xuất hiện triệu chứng và sau khi triệu chứng xuất hiện (tỷ lệ bệnh ≤ 1%). Kết quả cho thấy florylpicoxamid ở liều 150 g hoạt chất/ha và metominostrobin 80 g hoạt chất/ha cho hiệu quả kiểm soát bệnh thán thư trên trái ớt cao ở cả hai thời điểm xử lý. Các nghiệm thức tiếp theo về hiệu lực bao gồm florylpicoxamid 125 g hoạt chất/ha, azoxystrobin 150 g hoạt chất/ha và picoxystrobin 150 g hoạt chất/ha. Tỷ lệ nhiễm bệnh sau thu hoạch ở các nghiệm thức florylpicoxamid (tất cả các liều), metominostrobin 80 g hoạt chất/ha và picoxystrobin 150 g hoạt chất/ha dao động từ 10,0–14,4%, tương đương nhau và thấp hơn so với các nghiệm thức còn lại. Năng suất ớt thương phẩm ở các nghiệm thức florylpicoxamid 150 g hoạt chất/ha (20,41–20,54 tấn/ha) và metominostrobin 80 g hoạt chất/ha (19,70–20,53 tấn/ha) cao hơn và khác biệt có ý nghĩa thống kê so với các nghiệm thức khác. Kết quả nghiên cứu cho thấy Adavelt™ (florylpicoxamid) là một giải pháp tiềm năng trong quản lý bệnh thán thư trên cây ớt trong điều kiện sản xuất ngoài đồng ruộng.

Từ khóa: Florylpicoxamid, Ớt, Strobilurins, Thán thư, Thuốc trừ bệnh

1. INTRODUCTION

Chilli peppers (*Capsicum annum* L.), a widely grown spice crop cultivated around the world with high economic value, are used domestically and exported in various forms, such as fresh, dried, and processed chilli peppers. Like other crops, they are also susceptible to a variety of diseases. Among these, anthracnose is one of the most important and widespread diseases in all chilli-growing regions, causing significant losses of yield and quality, at 10-80% worldwide (Kambar et al., 2013; Mahasuk et al., 2009; Ramachandran, 2007). In Vietnam, chilli pepper production can be reduced by 70-80% due to anthracnose (Vu Trieu Man, 2007).

Chilli anthracnose *(Colletotrichum species)* can affect chilli peppers at almost all stages of their growth cycle. Symptoms are most evident on leaves and fruits during the fruit development stage in the field and even post harvest during storage. The disease spreads rapidly and severely, especially under conditions of high rainfall and humidity, which are common in Da Lat, especially during the rainy season. Symptoms typically appear as dark, sunken lesions on fruits, which can rapidly expand and cause rotting. The disease spreads quickly under favorable conditions, making timely intervention critical. Chemical control using fungicides is a component of integrated disease management for anthracnose in chilli peppers, especially during the rainy season when disease pressure is high. Some studies have shown that fungicides with contact and systemic activity have been effective in reducing the incidence and severity of anthracnose on chilli peppers (Bordoh et al., 2016; Harp et al., 2008)

Strobilurin fungicides, including azoxystrobin, picoxystrobin, and metominostrobin, are a broad-spectrum fungicide group that has been researched and shown to be highly effective in controlling anthracnose in chilli peppers (Devi et al., 2021; Madhavan et al., 2017; Saxena et al., 2016). Adavelt™ (florylpicoxamid), belonging to the picolinamide group, has broad-spectrum fungicidal activity, mainly affecting two fungal phyla, Ascomycota and Basidiomycota. It has been studied on various groups of plant pathogenic fungi, including *Colletotrichum* spp., the causal agent of anthracnose, and has shown promising results. Studies have also shown that florylpicoxamid does not have cross-resistance to strobilurins or azoles (Yao et al., 2021), which is favorable for rotating fungicide groups without causing cross-resistance. Therefore, a study was conducted to evaluate the efficacy of florylpicoxamid and common strobilurins in controlling anthracnose in chilli peppers in Vietnam.

2. MATERIALS AND METHODS

The experiment was conducted from July to November 2020 at the Corteva Agriscience Experimental Research Station in Don Duong, Lam Dong.

2.1. Materials

Four fungicides active ingredients used in the experiments were: florylpicoxamid 100SC, azoxystrobin 250SC, picoxystrobin 250SC, metominostrobin 200SC.

F1 JavaHot 308 chilli pepper seeds were selected - a popular variety grown in the Da Lat region of Lam Dong province - from Phu Sa Seed Company. The chilli pepper seeds were sown and planted at a density of 25,000 plants per hectare.

DOI: 10.46826/huaf-jasat.v10n2y2026.1298

2.2. Research methodology

The experiment was conducted under field conditions using a completely randomized block design with three replications and eight treatments: Control with no fungicide application; florylpicoxamid at 75, 100, 125, and 150 grams of active ingredient/hectare; azoxystrobin, picoxystrobin each with 150 grams of active ingredient/hectare; metominostrobin with 80 grams of active ingredient/hectare. Each experimental plot was 30 m^2, and 10 plants with uniform growth were marked in each plot to record disease incidence and yield. There were a total of 24 experimental plots.

Table 1. Treatment list details with rate and dose rate

Treatments	Rate (gram active ingredient per ha)	Dose rate (mL product/ha)
Adavelt™ (Florylpicoxamid 100 g/L)	75 g a.i./ha	750 mL/ha
Adavelt™ (Florylpicoxamid 100 g/L)	100 g a.i./ha	1000 mL /ha
Adavelt™ (Florylpicoxamid 100 g/L)	125 g a.i./ha	1250 mL /ha
Adavelt™ (Florylpicoxamid 100 g/L)	150 g a.i./ha	1500 mL /ha
Amistar 250SC (Azoxystrobin 250 g/L)	150 g a.i./ha	600 mL /ha
Aproach 250SC (Picoxystrobin 250 g/L)	150 g a.i./ha	600 mL/ha
Ringo-L 200SC (Metominostrobin 200 g/L)	80 g a.i./ha	400 mL /ha
Control	-	-

Disease source: The disease occurred under natural infection in the field, with high disease pressure during the rainy season.

Application method and timing: The fungicides were applied at the time of young fruit development, 7 times with a 5 day interval between applications. The fugicides were used according to the concentration and dosage for each treatment, the water volume was 600 liters/hectare (1.8 liters of water/30 m^2 experimental plot, 5.4 liters of water/3 replicates).

2.2.1 Experiment 1: First treatment of the fungicides before disease appearance on the fruit.

2.2.2 Experiment 2: First treatment of the fungicides after disease appearance on the fruit (disease rate below 1%).

Assessment and observation time:

Disease incidence: Count the number of diseased fruits and the total number of fruits on 10 marked trees. Calculate the disease incidence (DI) (%) = [(total number of diseased fruits/total number of observed fruits on the tree) x 100]. Then, calculate the average DIR of 10 trees/plot at each time point every 5 days after application (DAA).

Yield: Count all fruits on the tree and the total number of marketable fruits on the tree at each harvest.

Actual yield: Calculate the yield per plot by the total weight of marketable fruit on the plot (30 m^2 area) and then convert the resultant yield to ha (ton/ha).

Evaluate the post-harvest disease rate: Harvest 30 healthy, marketable chilli peppers for each treatment and store them at room temperature (25-28°C). Record and count the number of diseased fruits/total number of fruits. Calculate the percentage of diseased fruits at 3 and 5 days after harvest (DAH).

Data analysis: Recorded data was processed using Microsoft Office Excel 365, peforming ANOVA analysis and comparing differences by Duncan's method with SPSS version 20.

3. RESULTS AND DISCUSSION

3.1. Incidence (%) of diseased fruits

3.1.1 Disease incidence at Experiment 1 (applying fungicides before the disease symptom appeared)

Table 2 results show that the disease did not appear on any of the experimental plots before and after the first treatment (5DAT1), indicating that the treatment was preventive in nature. The disease appeared on the untreated control plots and Florylpicoxamid at 75 and 100 grams active ingredient/hectare plots 5 days after the second treatment (5DAT2).

Table 2. Incedence (%) of infected fruits over observation periods (Experiment 1)

Treatments	Incidence (%) infected fruits over recorded periods – preventive and curative application, Days after treated (DAT)								
	BA	5DAT1	5DAT2	5DAT3	5DAT4	5DAT5	5DAT6	5DAT7	AUDPC
Florylpicoxamid 75 gai/ha	0.0	0.0	1.8[b]	22.7[b]	38.8[b]	51.2[b]	67.2[d]	80.5[c]	564.9[b]
Florylpicoxamid 100 gai/ha	0.0	0.0	1.0[ab]	21.5[b]	34.0[b]	50.7[b]	66.8[d]	77.9[c]	520.7[b]
Florylpicoxamid 125 gai/ha	0.0	0.0	0.0[a]	0.2[a]	6.6[a]	13.0[a]	25.7[abc]	32.2[b]	471.3[b]
Florylpicoxamid 150 gai/ha	0.0	0.0	0.0[a]	0.0[a]	2.4[a]	6.1[a]	10.0[ab]	13.9[a]	220.0[b]
Azoxystrobin 150 g.ai/ha	0.0	0.0	0.0[a]	1.0[a]	11.2[a]	19.3[a]	30.7[c]	42.3[b]	561.7[b]
Picoxystrobin 150 g.ai/ha	0.0	0.0	0.0[a]	0.2[a]	8.5[a]	15.5[a]	27.5[bc]	36.1[b]	258.6[b]
Metominostrobin 80 g.ai/ha	0.0	0.0	0.0[a]	0.0[a]	2.0[a]	3.3[a]	6.1[a]	11.2[a]	192.8[b]
Control	0.0	0.0	2.1[b]	30.1[b]	42.1[b]	56.8[b]	70.1[d]	81.3[c]	1153.9[b]
Significant level	ns	ns	*	**	**	**	**	**	**
CV (%)			128.73	60.22	42.38	36.27	28.74	17.17	30.44

Means with the same letter following them are not significantly different at the 5% level by Duncan's test.
*: statistically different at the 1% level. *: statistically different at the 5% level,*
ns: not statistically different.

The prevalence of fruits infected by anthracnose increased significantly over all evaluation periods. Among the treatments, florylpicoxamid at 125 and 150 grams of active ingredient/hectare, and three strobilurins, Metominostrobin 80 grams active ingredient/hectare, Picoxystrobin and Azoxystrobin 150 gram active ingredient per hectare showed significantly lower disease incidence compared to the untreated control, from 5 DAT3 to 5 DAT5.

At the 5 DAT7 time point, the florylpicoxamid 150 g.ai/ha treatment recorded a disease incidence rate (13.9%) that was not significantly different from the metominostrobin (11.2%), while this disease incidence was significantly lower than the untreated control treatment (81.7%). The AUDPC values show that Florylpicoxamid at higher rates (125, 150 g a.i./ha), Azoxystrobin, Picoxystrobin, and Metominostrobin all resulted in significantly lower disease progress compared to the control. Metominostrobin (80 g a.i./ha) had the lowest AUDPC (192.8), indicating the best suppression of disease progress over time. Florylpicoxamid at 150 g a.i./ha also performed very well (AUDPC 220.0), followed by 125 g a.i./ha (471.3)

This result demonstrates that florylpicoxamid @ 150 g ai/ha is effective preventative application, by controlling anthracnose before pathogen infection of the fruits through inhibition of spore germination (Yao et al., 2021), and is

DOI: 10.46826/huaf-jasat.v10n2y2026.1298

equally effective as metominostrobin 80 g ai/ha.

3.1.2 Disease incidence at Experiment 2 (applying fungicides after the disease onset)

Prior to fungicide application, the disease incidence in the trials was below 1%, indicating that anthracnose had already infected the fruits and showed symptoms. Therefore, fungicide application had both preventive and curative requirements (Table 3). With the high rainfall and humidity, the disease having infected and showed symptoms, increased rapidly in the untreated control trials (87.63% at 5 DAT7) and even in the treated plots, reducing the disease control efficacy of the treatments compared to application before the appearance of lesions. Among these, florylpicoxamid 150 g a.i./ha (0.70% - 13.23%) showed good anthracnose control with low disease incidence on fruits at all assessment times similar to metominostrobin 80 g a.i./ha and followed by picoxystrobin 150 g a.i./ha (0.30% - 18.13%). Azoxystrobin 150 g a.i./ha was less effective than other trials, equivalent to florylpicoxamid 100-125 g a.i./ha. Florylpicoxamid at 150 g a.i./ha had the lowest AUDPC (126.8), indicating the best disease control in both preventive and curative applications. Metominostrobin (80 g a.i./ha) also showed low AUDPC (84.9), confirming its strong efficacy. Other treatments (Azoxystrobin, Picoxystrobin, Florylpicoxamid at lower rates) had intermediate AUDPC values, showing moderate efficacy.

Table 3. Incidence (%) of diseased fruits over observation times (Experiment 2)

Treatments	Incidence (%) infected fruits over recorded periods – preventive and curative application, Days after treated (DAT)								
	BA	5DAT1	5DAT2	5DAT3	5DAT4	5DAT5	5DAT6	5DAT7	AUDPC
Florylpicoxamid 75 gai/ha	0.4	3.1abc	6.5abc	11.2ab	17.4b	23.2c	31.1c	40.6b	1109.9a
Florylpicoxamid 100 gai/ha	0.3	3.0abc	6.6abc	11.2ab	16.8b	21.5bc	27.2bc	35.3ab	1063.9a
Florylpicoxamid 125 gai/ha	0.7	3.8abc	6.3ab	9.7ab	12.6ab	19.6abc	24.5abc	35.1ab	307.9b
Florylpicoxamid 150 gai/ha	0.4	1.7ab	3.1ab	5.0ab	7.1ab	8.9a	11.2a	13.2a	126.8b
Azoxystrobin 150 g.ai/ha	0.5	3.9bc	8.2bc	11.8b	17.4b	22.6c	28.5bc	39.4b	417.3b
Picoxystrobin 150 g.ai/ha	0.3	1.7ab	3.4ab	5.7ab	7.9ab	10.3ab	13.4ab	18.1ab	348.9b
Metominostrobin 80 g.ai/ha	0.5	1.2a	2.3a	4.0a	6.1a	7.6a	10.1a	14.0a	84.9b
Control	0.7	5.6c	11.9c	21.8c	34.3c	47.6d	65.3d	87.6c	1209.3a
Significant level	ns	*	*	**	**	**	**	**	**
CV (%)	40.6	44.32	48.11	37.00	36.50	32.32	30.81	33.75	35.59

*Means with the same letter following them are not significantly different at the 5% level by Duncan's test. **: statistically different at the 1% level. *: statistically different at the 5% level, ns: not statistically different.*

3.2. Postharvest Disease Incidence (%)

The results from Experiment 1 of evaluating post-harvest disease incidence (Table 4) showed 3 days after harvest (3 DAH), the disease incidence for all treatments ranged from 2.2% to 7.8%. The post-harvest disease incidence observed from picoxystrobin, and azoxystrobin treatments was the highest at 7.8%, and 6.7

%, respectively, which were significantly higher than the other treatments and similar to the untreated control which had 7.8% incidence.

At the 5 DAH point, the incidence of fruits with anthracnose increased rapidly. The untreated control treatment had the highest disease incidence with 35.6% diseased fruits, followed by the azoxystrobin treatment with 22.2% diseased fruits, which was significantly different from the other treatments. All florylpicoxamid treatments, metominostrobin 80 g a.i./ha and picoxystrobin 150 g a.i./ha has much reduced incidence ranging from 10 to 13.3%.

Florylpicoxamid (all rates) and Metominostrobin resulted in the lowest AUDPC values (ranging from 15.6 to 23.3), indicating effective postharvest disease control. Azoxystrobin and Picoxystrobin had higher AUDPC values (38.9 and 32.8 respectively), showing less efficacy compared to Florylpicoxamid and Metominostrobin. This result indicates that florylpicoxamid at 150 g a.i/ha and metominostrobin at 80 g a.i/ha not only effectively control anthracnose on fruits in the field but also protect fruits post harvest.

Table 4. Incidence (%) of postharvest diseased fruits

Treatments	Incidence (%) of postharvest infected fruits Days after harvest (DAH)		AUDPC
	3 DAH	5 DAH	
Florylpicoxamid 75 g a.i./ha	2.2[a]	11.1[a]	16.7[a]
Florylpicoxamid 100 g a.i./ha	3.3[ab]	10.0[a]	18.3[a]
Florylpicoxamid 125 g a.i./ha	2.2[a]	10.0[a]	15.6[a]
Florylpicoxamid 150 g a.i./ha	3.3[ab]	10.0[a]	18.3[a]
Azoxystrobin 150 g a.i./ha	6.7[bc]	22.2[b]	38.9[b]
Picoxystrobin 150 g a.i./ha	7.8[c]	13.3[a]	32.8[a]
Metominostrobin 80 g a.i./ha	4.4[abc]	12.2[a]	23.3[a]
Control	7.8[c]	35.6[c]	55.0[b]
Significant level	**	**	**
CV (%)	42.35	21.04	25.71

*Means with the same letter following them are not significantly different at the 5% level by Duncan's test, **: statistically different at the 1% level*

3.3. Actual yield at harvest time

The results presented in Table 5 indicate that marketable chilli pepper yield was significantly higher in treatments with florylpicoxamid at 150 g a.i./ha (20.41 and 20.54 t/ha) and metominostrobin at 80 g a.i./ha (20.53 and 19.70 t/ha) compared with the other treatments. This outcome is consistent with findings that these treatments provided more effective control of anthracnose under both field and post-harvest conditions. The second highest-yielding group included florylpicoxamid at 125 g a.i./ha, picoxystrobin at 150 g a.i./ha, and azoxystrobin at 150 g a.i./ha. In conclusion, florylpicoxamid at 150 g a.i./ha and metominostrobin at 80 g a.i./ha not only achieved superior yields but also demonstrated consistent disease control, making them the most promising options for improving chilli productivity and post-harvest quality under the tested conditions.

DOI: 10.46826/huaf-jasat.v10n2y2026.1298

Table 5. Yield of marketable chilli peppers (ton/ha)

Treatments	Total of chilli pepper yields (ton/ha) in 4 harvesting times	
	Experiment 1 (preventive)	Experiment 2 (preventive and curative)
Florylpicoxamid 75 g a.i./ha	8.16[de]	5.04[d]
Florylpicoxamid 100 g a.i./ha	9.79[d]	6.37[d]
Florylpicoxamid 125 g a.i./ha	16.38[b]	14.96[b]
Florylpicoxamid 150 g a.i./ha	20.41[a]	20.54[a]
Azoxystrobin 150 g a.i./ha	13.61[c]	9.75[c]
Picoxystrobin 150 g a.i./ha	15.60[bc]	10.82[c]
Metominostrobin 80 g a.i./ha	20.53[a]	19.70[a]
Control	6.50[e]	1.68[e]
Significant level	**	**
CV (%)	10.61	12.04

*Means with the same letter following them are not significantly different at the 5% level by Duncan's test, **: statistically different at the 1% level.*

4. CONCLUSION

Florylpicoxamid (Adavelt™) at 150 g a.i./ha and metominostrobin at 80 g a.i./ha provided the most effective control of anthracnose on chilli fruits under both field and post-harvest conditions, resulting in higher marketable yields compared with other treatments. No significant differences in efficacy were observed between preventive applications (before disease onset) and curative applications (after disease onset at ≤1% fruit infection) in terms of disease incidence throughout the assessment period, as well as yield performance of treated plots.

Further research is recommended to comprehensively evaluate fungicide rotation strategies involving florylpicoxamid (Adavelt™) and metominostrobin to optimize technical efficacy and support resistance management. In addition, studies on tank-mix combinations and optimal mixing ratios of florylpicoxamid with metominostrobin and other active ingredients are needed to achieve improved disease control and maximize economic returns through enhanced marketable yield.

REFERENCES

Bordoh, P., Singh, A., Siddiqui, Y., & Droby, S. (2016). Post-harvest development of anthracnose in pepper (*Capsicum* spp.): Etiology and management strategies. *Crop Protection,* 90, 132–141. DOI: https://doi.org/10.1016/j.cropro.2016.07.026

Devi, V., Theradimani, M., Thiruvudainambi, S., Raman, R., Beaulah, A., B. S., & Sampathrajan, V. (2021). Compatibility of strobilurin fungicides with *Bacillus subtilis* and their efficacy against chilli *Colletotrichum truncatum*. *he Pharma Innovation Journal*, 10, 127–130.

Harp, T. L., Pernezny, K., Ivey, M. L. L., Miller, S. A., Kuhn, P. J., & Datnoff, L. (2008). The etiology of recent pepper anthracnose outbreaks in Florida. *Crop Protection*, 27(10), 1380–1384. DOI: https://doi.org/10.1016/j.cropro.2008.05.006

Kambar, Y., M. N. V., M. M., T. R. P., & Nawaz, N. (2013). Inhibitory effect of cow urine against *Colletotrichum capsici* isolated from anthracnose of chilli (*Capsicum annuum* L.). *Science*, *Technology and Arts Research Journal*, 2, 91–93. DOI: https://doi.org/10.4314/star.v2i4.15

Madhavan, S., Adhipathi, P., Velazhahan, R., Paranidharan, V., & Karthikeyan, M. (2017). Management of chilli (*Capsicum annuum*) anthracnose using fungicides and biocontrol agents. *Indian Phytopathology*, 70, 86–90. DOI: https://doi.org/10.24838/ip.2017.v70.i1.48987

Mahasuk, P., Khumpeng, N., Wasee, S., Taylor, P. W. J., & Mongkolporn, O. (2009).

Inheritance of resistance to anthracnose (*Colletotrichum capsici*) at seedling and fruiting stages in chilli pepper (*Capsicum* spp.). *Plant Breeding*, 128(6), 701–706. DOI: https://doi.org/10.1111/j.1439-0523.2008.01615.x

Ramachandran, N. (2007). Current status of chilli anthracnose in India. *Proceedings of the First International Symposium on Chilli Anthracnose*, Seoul National University, Korea.

Saxena, A., Sarma, B. K., & Singh, H. B. (2016). Effect of azoxystrobin-based fungicides in management of chilli and tomato diseases. *Proceedings of the National Academy of Sciences, India Section B: Biological Sciences*, *86*(2), 283–289. https://doi.org/10.1007/s40011-014-0422-8

Vu Trieu Man (2007). *Specialized plant pathology textbook*. Hanoi University of Agriculture.

Yao, C., Meyer, K. G., Gallup, C., Bowling, A. J., Hufnagl, A., Myung, K., Lutz, J., Slanec, T., Pence, H. E., Delgado, J., & Wang, N. X. (2021). Florylpicoxamid, a new picolinamide fungicide with broad-spectrum activity. *Pest Management Science*, 77(10), 4483–4496. DOI: https://doi.org/10.1002/ps.6483