# EFFECTS OF PLANTING DATE AND INSECTICIDE TREATMENT ON BARLEY YELLOW DWARF VIRUS AND YIELD OF NUDA1 AND COKER 227 OATS- 1999-2000

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**Location:** Edisto Research and Education Center, Barnwell Co. SC, Field B-6 C

**Design:** 2x2x2 factorial with 8 replicates; main plot: planting date (Oct 15, Nov 16), subplot: variety (Coker 227, Nuda 1), sub-subplot: insecticide (Warrior 1EC, Untreated); plot size 5.33 x 40' (8 rows x 8" spacing)

**Soil Type:** Varina loamy sand

**Rotation:** Previous crops - corn 1999; peanut 1998; corn 1997

**Land Preparation:** Disk 2X , Terra-max Worksaver 12 - 13 inches deep perpendicular to plots. Plots were laid out with a 5-shank (12" spacing) chisel plow equipped with a spring-loaded leveling board.

**Seeding Rate:** At the highest drill setting, only 12-14 seed / row foot (42 / row meter) of Coker 227 could be planted. A lower setting was used for Nuda 1 such that the seeding rate was approximately the same.

**General Fertility:** No pre-plant fertilizer.
30 lbs N (11.3 gpa S-25) were applied Dec 20. 66 lbs N (25 gal S-25) were applied Feb 23. **Total N = 96 lbs / ac. Total S = 13.5 lbs/ac.**

**Herbicide:** Harmony Extra (0.5 oz/ac) was applied Dec 7.

**Insecticide:** Warrior 1EC (1 gal / 33 ac) was applied to designated plots Jan 13 in the Oct. planting date and Feb 22 in the Nov. planting date.

**Application:** Herbicide and N were applied with a tractor-mounted, three-point-hitch sprayer delivering 20 gallons per acre (gpa) through Tee Jet 8003 flat fan nozzles at 40 psi. Insecticide treatments were applied with a tractor-mounted $CO_2$ pressurized sprayer through Tee Jet 11003 ( 20.0 gpa @ 30 psi). The spray boom was protected with a shield to minimize drift.

**Treatments:**

| Variety | Oat Planting Date | Insecticide Treatment |
|---|---|---|
| 1. Nuda1 | Oct 15 | None |
| 2. Nuda1 | Oct 15 | Warrior (0.03 lb ai) Jan 13 |
| 3. Coker 227 | Oct 15 | None |
| 4. Coker 227 | Oct 15 | Warrior (0.03 lb ai) Jan 13 |
| 5. Nuda1 | Nov 16 | None |
| 6. Nuda1 | Nov 16 | Warrior (0.03 lb ai) Feb 22 |
| 7. Coker 227 | Nov 16 | None |
| 8. Coker 227 | Nov 16 | Warrior (0.03 lb ai) Feb 22 |

**Application:** Herbicide and nitrogen applications were made with a tractor-mounted, three-point-hitch sprayer delivering 20 gallons per acre (gpa) through Tee Jet 8003 flat fan nozzles at 40 psi. Warrior treatments were applied with a tractor-mounted $CO_2$ pressurized sprayer through Tee Jet 11003 ( 20.0 gpa @ 30 psi). The spray boom was protected with a shield to minimize drift.

**Sampling:** Aphids were counted from two, six-inch samples / experimental unit. Leaves and the soil surface were thoroughly examined first. Plants from a six-inch sample of non-yield rows were uprooted until jointing so below-ground portions of the stem could be examined for subterranean aphids (primarily rice-root aphids). Specimens that could not be field identified to species were returned to the lab for identification under the microscope.

Plots were scanned for BYDV plant symptoms by two observers each counting the number of symptomatic stems from three interior (non-border) rows Jan 7 (120 row feet each)and two interior rows (80 row feet each) on subsequent sample dates.

Plots were harvested with an Almaco plot combine. Test weight was taken by funneling a subsample of grain through a Seedburo No. 151 filling hopper and weighing one dry pint of grain on an electronic scale. Grain moisture content was measured with a Burrows DMC-700 moisture meter. All yields were adjusted to 12 % moisture before analysis.

**Analysis:** ANOVA, using SAS PROC GLM mixed model. Fisher's protected LSD, (P=0.05).

**Table 1. Effect of oat variety, planting date, and insecticide treatment on peak bird cherry-oat aphid (BCOA) population, barley yellow dwarf (BYD) flag leaf symptoms, yield, and test weight. Blackville, SC 2000.**

| Oat variety | Planting date | Treatment [a] | Peak BCOA population / m Mar 9 | BYD / m Apr 19 | Yield bu/ac (LSD = 8) | Test Weight lb/bu |
|---|---|---|---|---|---|---|
| Coker 227 | Oct 15 | Warrior Jan 13 | 2 d | 1.1 cd | 158 a | 36.0 bc |
| Nuda 1 | Oct 15 | Warrior Jan 13 | 4 d | 1.3 cd | 140 b | 37.7 a |
| Coker 227 | Oct 15 | Untreated | 443 b | 8.9 a | 136 bc | 35.3 c |
| Coker 227 | Nov 16 | Warrior Feb 22 | 0 d | 0.6 d | 131 cd | 34.7 c |
| Nuda 1 | Oct 15 | Untreated | 1339 a | 4.7 b | 127 de | 37.3 ab |
| Coker 227 | Nov 16 | Untreated | 131 c | 2.0 c | 124 de | 34.8 c |
| Nuda 1 | Nov 16 | Warrior Feb 22 | 0 d | 0.3 d | 123 de | 37.7 a |
| Nuda 1 | Nov 16 | Untreated | 218 bc | 0.7 cd | 121 e | 36.9 ab |
| **variety effect** | ---- | ---- | * f=7.50, *P* = 0.0169 | ** f=14.73, *P* =0.0004 | * f=7.44, *P* =0.0134 | * f=43.95, *P* =0.0001 |
| **planting date effect** | ---- | ---- | n.s. f=5.10, *P* = 0.1525 | ** f=73.03, *P* = 0.0001 | ** f=124.70, *P* =0.0001 | n.s. f=0.2436, *P* = 0.5354 |
| **insecticide effect** | ---- | ---- | ** f=124.37, *P* = 0.0001 | ** f=86.87, *P* = 0.0001 | ** f=15.04, *P* =0.001 | n.s. f=2.29, *P* = 0.1379 |
| **variety x planting date effect** | ---- | ---- | n.s. f=3.15, *P* =0.0995 | n.s. f=3.20, *P* = 0.0812 | n.s. f=3.78, *P* =0.0669 | n.s. f=0.4484, *P* = 0.5073 |
| **variety x insecticide effect** | ---- | ---- | * f=6.88, *P* = 0.0211 | ** f=16.10, *P* = 0.0002 | n.s. f=3.14, *P* =0.0925 | n.s. f=0.3975, *P* = 0.5322 |
| **planting date x insecticide effect** | ---- | ---- | ** f=19.20, *P* = 0.0007 | ** f=43.19, *P* = 0.0001 | * f=5.05, *P* =0.0366 | n.s. f=0.1228, *P* = 0.7280 |

**Column means followed by the same letter are not significantly different. Fisher's protected LSD (*P*=0.05).**

**[a] Warrior 1 EC, 3.87 oz / ac.**

[b] **BCOA population in the Oct planted Nuda 1 check was 7.0 / ft (23 / m) on Dec 17 and 21.0 / ft (69 / m) on Jan 7. Since significantly fewer aphids were found on the Coker 227 oats in this earlier planting date, insecticide application was delayed until the average population exceeded 10 / ft. This resulted in a less than optimum timed application in the Oct planted oats. Average pre-treatment Nov planted oat BCOA populations were 6.0 / ft.**

**Table 2. Effect of variety, planting date, and insecticide treatment on seasonal aphid populations, Blackville, SC 2000.**

| | | | Nov 11 Oct GS 11 | | | | Nov 19 Oct GS 21 | | | | Dec 3 Oct GS 24 Nov GS 11 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Variety | Planting Date | Insecticide Treatment | GB | RR | BC | EG | GB | RR | BC | EG | GB | RR | BC | EG |
| Nuda1 | Oct 15 | None | 4.6 | 3.3 | 0 | 0 | 13.1 | 2.0 | 0 | 0 | 17.2 | 3.3 | 13.9 a | 4.1 |
| Nuda1 | Oct 15 | Warrior 1EC | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Coker 227 | Oct 15 | None | 0 | 3.9 | 0 | 0 | 13.1 | 0.7 | 0 | 1.3 | 9.0 | 0.8 | 0.8 b | 0 |
| Coker 227 | Oct 15 | Warrior 1EC | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Nuda1 | Nov 16 | None | --- | --- | --- | --- | --- | --- | --- | --- | 15.6 | 1.6 | 2.5 ab | 0 |
| Nuda1 | Nov 16 | Warrior 1EC | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Coker 227 | Nov 16 | None | --- | --- | --- | --- | --- | --- | --- | --- | 13.1 | 0.8 | 0 b | 0.8 |
| Coker 227 | Nov 16 | Warrior 1EC | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

**Column means followed by the same letter or no letter are not significantly different. Fisher's protected LSD($P$ = 0.05)**

**Table 2. Continued.**

| | | | Dec 17<br>Oct GS 26<br>Nov GS 21 | | | | Jan 7<br>Oct GS 30<br>Nov GS 24 | | | | Feb 2<br>Oct GS 30<br>Nov GS 24 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Variety** | **Planting Date** | **Insecticide Treatment** | **GB** | **RR** | **BC** | **EG** | **GB** | **RR** | **BC** | **EG** | **GB** | **RR** | **BC** | **EG** |
| **Nuda1** | **Oct 15** | **None** | **40.1 a** | **0.8** | **23.0 a** | **0.8** | **9.2** | **0** | **69.5 a** | **2.6** | **26.2 a** | **0** | **190.2 a** | **13.9** |
| **Nuda1** | **Oct 15** | **Warrior 1EC** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** |
| **Coker 227** | **Oct 15** | **None** | **16.4 ab** | **0** | **0 b** | **0.8** | **7.9** | **0** | **13.1 ab** | **0** | **13.9 a** | **0** | **89.4 a** | **16.4** |
| **Coker 227** | **Oct 15** | **Warrior 1EC** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** |
| **Nuda1** | **Nov 16** | **None** | **3.3 b** | **4.1** | **1.6 b** | **3.3** | **7.9** | **1.3** | **0 b** | **32.8** | **0.8** | **0** | **4.9 b** | **2.5** |
| **Nuda1** | **Nov 16** | **Warrior 1EC** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** |
| **Coker 227** | **Nov 16** | **None** | **13.1 b** | **4.1** | **0.8 b** | **0.8** | **6.6** | **1.3** | **0 b** | **1.3** | **0.8 b** | **0** | **6.6 b** | **1.6** |
| **Coker 227** | **Nov 16** | **Warrior 1EC** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** |

**Column means followed by the same letter or no letter are not significantly different. Fisher's protected LSD($P$ = 0.05).**

**Table 2. Continued.**

| | | | Feb 22 Oct GS 31 Nov GS 25 | | | | Mar 9 Oct GS 47 Nov GS 31 | | | | Mar 28 Oct GS 59 Nov GS 49 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Variety | Planting Date | Insecticide Treatment | GB | RR | BC | EG | GB | RR | BC | EG | GB | RR | BC | EG |
| Nuda1 | Oct 15 | None | 19.7 | 0 | 736.4a | 89.4a | 10.9a | 0 | 1339a | 78.7a | 0 | 0 | 13.1 | 15.6 |
| Nuda1 | Oct 15 | Warrior 1EC | --- | --- | --- | --- | 0 b | 0 | 4.4 d | 0 c | --- | --- | --- | --- |
| Coker 227 | Oct 15 | None | 32.8 | 0 | 212.4b | 21.3b | 0 b | 0 | 443b | 47.0ab | 0 | 0 | 5.7 | 4.9 |
| Coker 227 | Oct 15 | Warrior 1EC | --- | --- | --- | --- | 0 b | 0 | 2.2 d | 0 c | --- | --- | --- | --- |
| Nuda1 | Nov 16 | None | 4.9 | 0.8 | 20.5b | 4.9b | 1.1 b | 0 | 216bc | 28.4bc | 0 | 0 | 12.3 | 18.9 |
| Nuda1 | Nov 16 | Warrior 1EC | --- | --- | --- | --- | 0 b | 0 | 0 d | 0 c | --- | --- | --- | --- |
| Coker 227 | Nov 16 | None | 1.6 | 0 | 18.0b | 5.7b | 3.3 b | 0 | 131c | 10.9bc | 0 | 0 | 16.4 | 10.7 |
| Coker 227 | Nov 16 | Warrior 1EC | --- | --- | --- | --- | 0 b | 0 | 0 d | 0 c | --- | --- | --- | --- |

Column means followed by the same letter or no letter are not significantly different. Fisher's protected LSD($P = 0.05$).

**Table 3. Effects of variety, planting date, and insecticide treatment on seasonal oat BYDV symptoms. Blackville, SC 2000.**

| Variety | Planting Date | Insecticide Treatment | Jan 7 Oct GS 30 | Feb 21 Oct GS 31 Nov GS 25 | Mar 10 Oct GS 47 Nov GS 31 | Mar 21 Oct GS 50% hd. Nov GS 20% hd. | Apr 19 Oct GS late milk Nov GS ½ kern. |
|---|---|---|---|---|---|---|---|
| Nuda1 | Oct 15 | None | 0.03 | 0.44 a | 0.23 a | 0.55 ab | 4.7 b |
| Nuda1 | Oct 15 | Warrior 1EC | 0.02 | 0.27 a | 0.14 ab | 0.42 bc | 1.3 cd |
| Coker 227 | Oct 15 | None | 0.03 | 0.35 a | 0.21 a | 0.74 a | 8.9 a |
| Coker 227 | Oct 15 | Warrior 1EC | 0.03 | 0.26 a | 0.04 b | 0.16 cd | 1.1 cd |
| Nuda1 | Nov 16 | None | --- | 0.03 b | 0.01 b | 0.01 d | 0.7 cd |
| Nuda1 | Nov 16 | Warrior 1EC | --- | 0.01 b | 0.01 b | 0.01 d | 0.3 d |
| Coker 227 | Nov 16 | None | --- | 0.003 b | 0.00 b | 0.01 d | 2.0 c |
| Coker 227 | Nov 16 | Warrior 1EC | --- | 0.02 b | 0.01 b | 0.03 d | 0.6 d |

**Column means followed by the same letter or no letter are not significantly different. Fisher's protected LSD(*P* = 0.05).**

**Figure 1.**

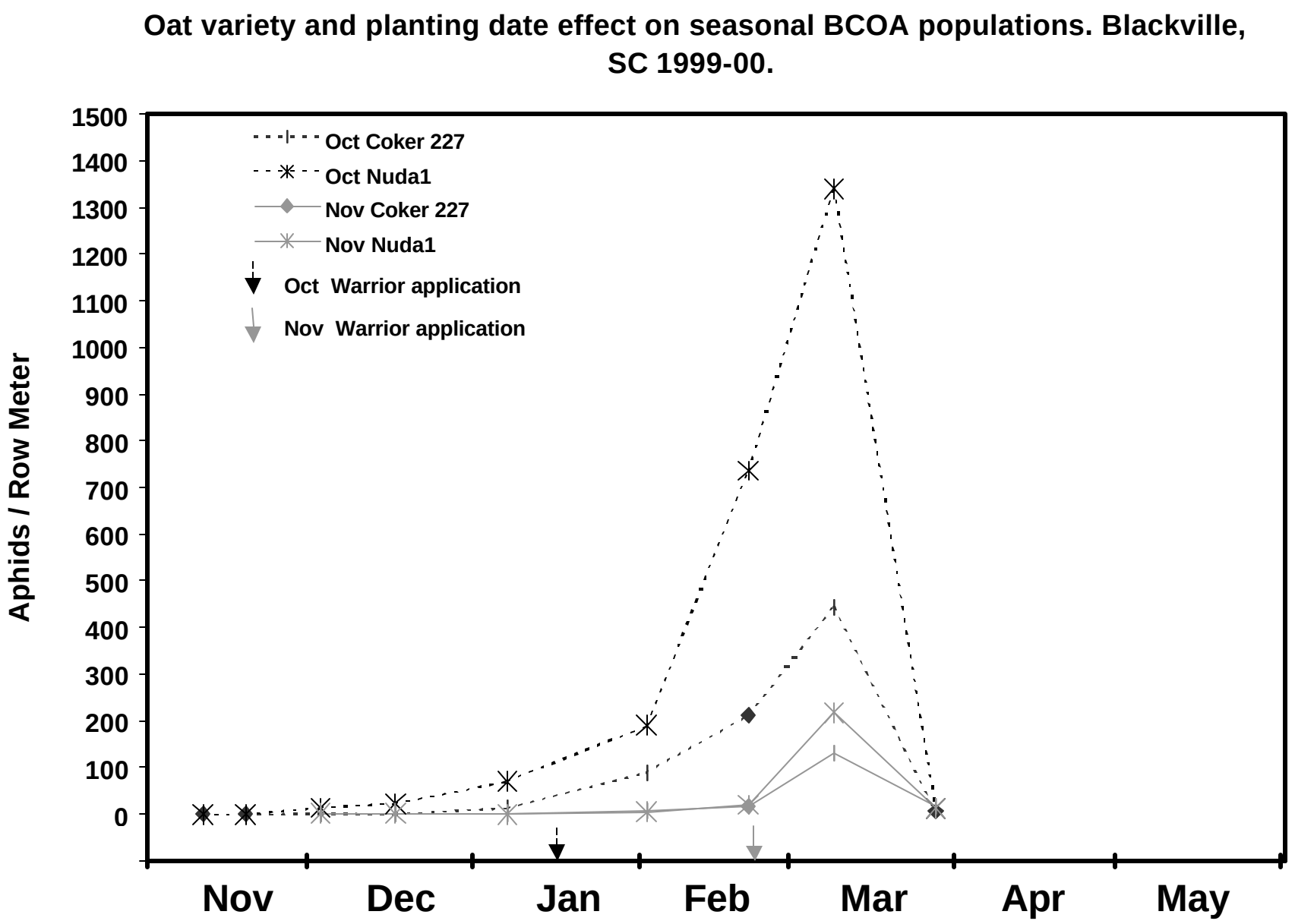
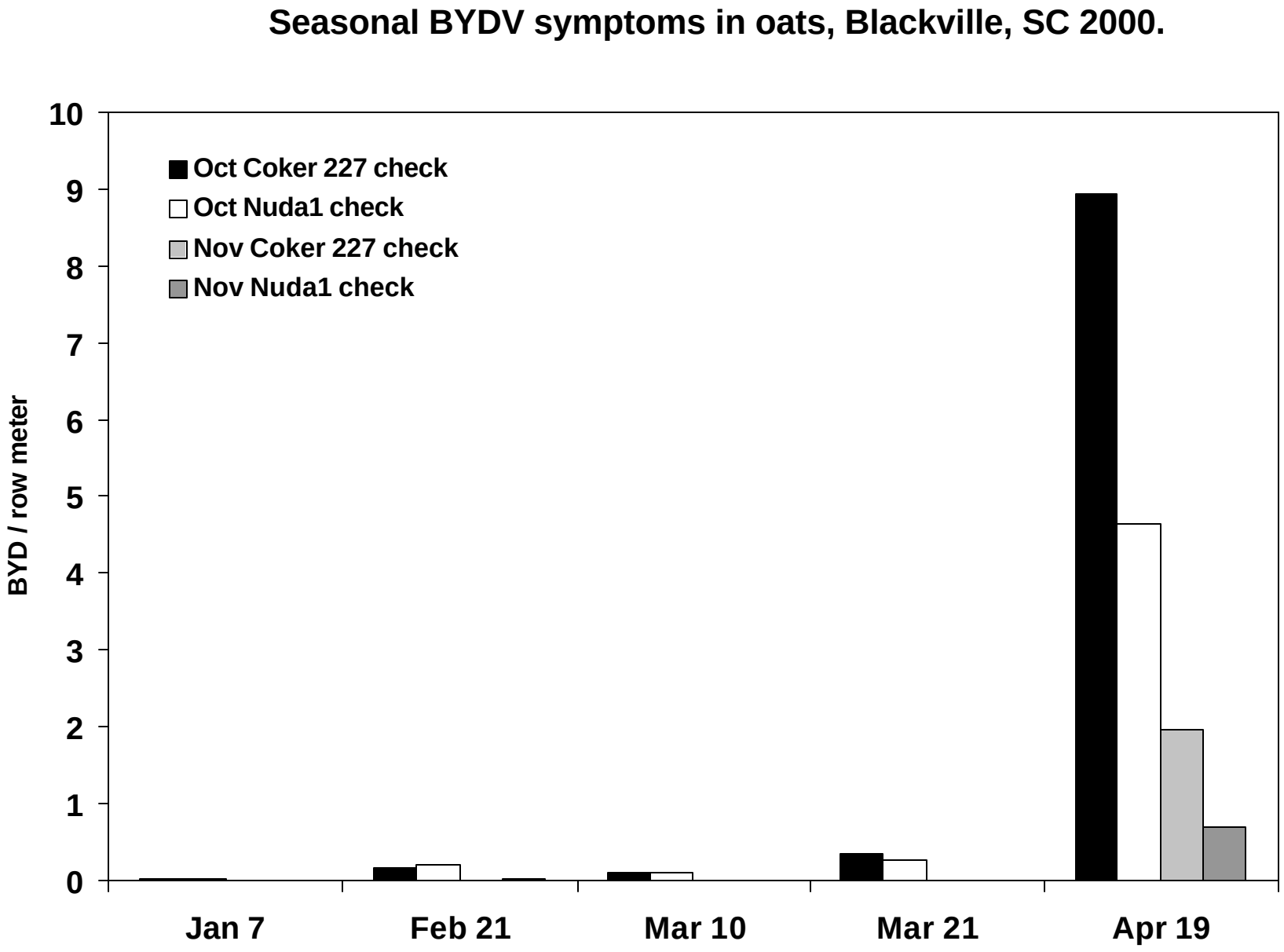


**Figure 2.**


Seasonal BYDV symptoms in oats, Blackville, SC 2000.
BYD / row meter
10
9
8
7
6
5
4
3
2
1
0
Oct Coker 227 check
Oct Nuda1 check
Nov Coker 227 check
Nov Nuda1 check
Jan 7
Feb 21
Mar 10
Mar 21
Apr 19