

High risk situations: Susceptible cultivar, history of disease, irrigation, short rotation

5 or 6 sprays or by advisory, starting at R3 or about 7 weeks after planting

Goal of application and product examples	Total applications (out of 5 or 6)	Key application timing	Other suggested application times
A Leaf spot control and resistance management Bravo 1.5 pt (or generic chlorothalonil, usually 1.5 pt), group M Chlorothalonil 1.5 pt + Alto 5.5 oz Chlorothalonil 1.5 pt + Topguard 7-14 oz Chlorothalonil 1.5 pt in tank mixes (see below)	1 or 2 1 additional	15 weeks	7, 9, or 11 weeks
B Leaf spot + stem rot control Provost 10.7 oz, group 3 Elatus 7.3 oz, groups 7, 11 Tebuconazole 7.2 oz + chlorothalonil 1.5 pt* Convoy 16 oz. group 7 + chlorothalonil 1.5 pt* Fonteils 16 oz, group 7**	2	7 or 9 weeks	11 weeks
C Aggressive leaf spot control*** Priaxor 6 - 8 oz, groups 7, 11 Headline 6 - 9 oz, group 11 Abound 12 oz, group 11 (provides some stem rot control) Miravis, 3.4 oz, group 7 ??? Elatus, 7.3 oz, groups 7,11 Tank mixes with chlorothalonil	1 or 2	13 weeks	7, 9, or 11 weeks

* other tank mixing partners can be used for leaf spot control

** Consecutive applications not recommended

Assumes 5 fungicide applications at 2-week intervals starting at R3, or approximately 7 weeks after planting

Resistance management guidelines: no more than 2 applications an unmixed group 3, 7, or 11 fungicides and no more than 3 applications of premixes from these groups

***Chlorothalonil tank mixes – if in doubt, add ≥ 1 pt chlorothalonil

Moderate risk situations: Moderately resistant cultivar, excellent rotation, moderate disease history, dryland

4 or 5 sprays or by advisory, starting at R3+2 weeks, or about 9 weeks after planting

Goal of application and product examples	Total applications (out of 4 or 5)	Key application timing	Other suggested application times
A Leaf spot control and resistance management Bravo 1.5 pt (or generic chlorothalonil, usually 1.5 pt), group M Chlorothalonil 1.5 pt + Alto 5.5 oz Chlorothalonil 1.5 pt + Topguard 7-14 oz Chlorothalonil 1.5 pt in tank mixes (see below)	1 to 2 1 additional	15 weeks	9 or 11 weeks
B Leaf spot + stem rot control Provost 10.7 oz, group 3 Elatus 7.3 oz, groups 7, 11 Tebuconazole 7.2 oz + chlorothalonil 1.5 pt* Convoy 16 oz. group 7 + chlorothalonil 1.5 pt* Fonteils 16 oz, group 7**	1 to 2	9 or 11 weeks	9 or 11 weeks
C Aggressive leaf spot control*** Priaxor 6 - 8 oz, groups 7, 11 Headline 6 - 9 oz, group 11 Abound 12 oz, group 11 (provides some stem rot control) Miravis, 3.4 oz, group 7 ???Elatus, 7.3 oz, groups 7,11 Tank mixes with chlorothalonil	1 to 2	13 weeks	9 or 11 weeks

* other tank mixing partners can be used for leaf spot control

** Consecutive applications not recommended

Assumes 4 fungicide applications at 2-week intervals starting at R3 + 2 weeks, or approximately 9 weeks after planting

Resistance management guidelines: no more than 2 applications from each of group 3, 7, or 11, alone or in mixture

***Chlorothalonil tank mixes – if in doubt, add ≥ 1 pt chlorothalonil

Disease management goals

- A** Leaf spot control and resistance management
- B** Leaf spot + stem rot control
- C** Aggressive leaf spot control

Timing of 5-6 sprays for high risk situations

		7 weeks	9 weeks	11 weeks	13 weeks	15 weeks	17 weeks (if needed)
Options	1	B	A or C	B	C	A	A
	2	A or C	B	B	C	A	A
	3	B	B	A or C	C	A	A

Timing of 4-5 sprays for moderate risk situations

		7 weeks	9 weeks	11 weeks	13 weeks	15 weeks	17 weeks (if needed)
Options	1	—	B	A or C	C	A	A
	2	—	A or C	B	C	A	A
	3	—	B	B	C	A	A

Chlorothalonil tank mixes – if in doubt, add ≥ 1 pt chlorothalonil

Alternative group M fungicides: Copper, Sulfur, mancozeb (Koverall), Kocide

Things that increase leaf spot risk

Short rotation – Risk decreases each year out of peanut; 4 to 5 year optimal; Control volunteers!

Previous history of poor control

Irrigation

Late planting

Wet years, high humidity – check advisory!

Delayed sprays, rain after a spray

Delayed harvest

Risk increases further south

Shade, low spots, wet spots, rank vine growth

Ineffective fungicide – could vary with area

Poor fungicide rotations

Late leaf spot is higher risk than early leaf spot

Comparison of commonly used peanut fungicides 2018

Fungicide oz/A	Group	Leaf spots	Stem rot/ Limb rot	Strengths	Limitations
Abound (azoxystrobin) 12 – 18 oz	11	✓	✓	•Very good leaf spot and web blotch control where still effective •Good stem rot control •Excellent Rhizoctonia limb and pod rot control	•Strong likelihood that some populations are resistant •Less effective against established stem rot infections than some other products •Rain or irrigation is needed to optimize benefits of high rates (18 oz) for stem rot control •Resistance risk; no more than 2 applications
Alto (cyproconazole) 5.5 oz	3	✓		•Limited curative action •Very good leaf spot control •Substitute for Tilt for first spray	•Resistance risk •Mix with chlorothalonil •Limited control of soil borne pathogens
Bravo (chlorothalonil) 1.5 pt (or generic)	M	✓		•Low cost •Resistance management •Very good leaf spot control	•Limited supplies •No control of soil borne pathogens •Full season use can flare spider mites and make Sclerotinia blight worse •Non-systemic with no curative action
Convoy (flutolonil) 16 oz	7		✓	•Very good – excellent stem rot control	•NO leaf spot control. MUST be mixed with a leaf spot fungicide. •See label for other rates and spray intervals •Follow resistance guidelines for Group 7
Elatus (benzovindiflupyr + azoxystrobin) 7.3 – 9.5 oz	7 + 11	✓	✓	•Very good – excellent stem rot, limb rot and pod rot control •Good - excellent leaf spot control	•Erratic leaf spot control in some areas; alternate with a good leaf spot fungicide •Resistance risk; no more than 2 applications

Comparison of commonly used peanut fungicides 2018 (cont)

Fungicide oz/A	Group	Leaf spots	Stem rot/ Limb rot	Strengths	Limitations
Fontelis (penthiopyrad) 16 oz	7	✓	✓	•Very good stem rot control •Good leaf spot control •Some suppression of Sclerotinia blight at high rates (>16 oz)	•Appears to be slightly less effective against leaf spot than industry standards. Alternate with another product to optimize leaf spot control. •No more than 2 of 5 (or 1 of 4) applications due to resistance risk
Headline (pyraclostrobin) 6 – 15 oz	11	✓	✓	•Long residual and wash–off resistance •Excellent leaf spot and web blotch control •Some curative action	•Strong likelihood that some populations are resistant •High rates are needed for stem rot control and stem rot control can be erratic •No more than 2 applications per year due to resistance risk
Miravis 3.4 oz (Pydiflumetofen)	7	✓		•Very long residual •Excellent leaf spot control •Some suppression of Sclerotinia blight	•Not labeled for stem rot control •Alternate with a good stem rot fungicide •No more than 2 of 5 (or 1 of 4) applications due to resistance risk
Priaxor (pyraclostrobin + fluxapyroxad) 6 - 8 oz	11 + 7	✓	✓	•Long residual and wash–off resistance •Excellent leaf spot and web blotch control •Some curative action	•High rates are needed for stem rot control and stem rot control can be erratic •Follow resistance management guidelines for Group 11 and Group 7
Propulse 13.7 oz (prothioconazole + fluopyram)	3+7	✓	✓	•Excellent leaf spot and stem rot control •Suppresses nematodes when applied in early season (see label for details) •Long residual	•Expensive

Comparison of commonly used peanut fungicides 2018 (cont)

Fungicide oz/A	Group	Leaf spots	Stem rot/ Limb rot	Strengths	Limitations
Provost (tebuconazole + prothioconazole) 8 – 10 oz	3	✓	✓	•Very good – excellent stem rot, limb rot and pod rot control •CBR suppression •Very good leaf spot control	•Erratic leaf spot control has been reported in some areas •Resistance risk; Alternate with other chemistry to prevent loss of effectiveness
Tebuconazole 7.2 oz (generic)	3	✓	✓	•Very good – excellent stem rot, limb rot and pod rot control •Poor - good leaf spot control	•Poor leaf spot control due to fungicide resistance in some locations; not effective against late leaf spot due to resistance •Always mix with Bravo or other product for leaf spot control
Topsin M 70 WP 8 oz dry wt (Thiophanate-methyl; many brands and formulations)	1	✓		•Very good leaf spot control •Use as alternative to Bravo	•Very high risk of resistance development; use no more than once per season
Topguard (flutriafol) 7-14 oz	3	✓	✓	•Good leaf spot control •Substitute for Tilt for first spray	•Most useful mixed with another a.i. •Resistance risk

Peanut fungicide comments 2018

- Apply the first spray at R3 (very early pod) or R3 + 2 weeks in low risk situations. **Well rotated** peanuts need a total 5 sprays (4 sprays for low risk) applied at 2 week intervals in most seasons. The number of sprays required can be reduced by using the peanut leaf spot advisory after the first spray.
- The right program for a particular field depends on the overall disease risk for that fields. For additional help, see the peanut risk decision aid
 - **High risk** fields include those on short rotations (less than three years between peanut crops), fields with a previous disease history, irrigated fields, and fields planted to susceptible cultivars. Each of these factors increases disease risk.
 - **Low risk** fields include dryland fields with long rotations (≥ 4 years) and no previous history of difficult disease problems. Planting a resistant cultivar helps to reduce disease risk. Each of these factors reduces disease risk.
- Rotational crops that increase risk of soilborne diseases include soybeans, tobacco, tomatoes, melons, and many other vegetables. Remember that diseases caused by peanut pathogens can have different names in other crops or regions. For example: stem rot = white mold (peanut) , Southern blight; Rhizoctonia = sore-shin, belly rot, damping off; CBR = red crown rot; Sclerotinia blight = white mold (vegetables)
- All products have relative strengths and weaknesses. Fungicides from different groups (3, 7, 11) tend to be complementary in their activity. A fungicide program that includes different groups of fungicides takes advantage of the strengths of these groups (3, 7, 11) and also helps to reduce the risk of fungicide resistance.
- Use a multisite (Group M) fungicide to prevent resistance to any group. Be aware that Group M fungicides provide foliar disease control only. If in doubt about the performance of another type of fungicide, tank mix with a group M fungicide.
- Repeated applications of the fungicide chlorothalonil (Bravo; Group M) can flare spider mites and make Sclerotinia blight worse. Switch to a different fungicide during hot, dry periods. Avoid repeated applications of chlorothalonil in fields with a history of Sclerotinia blight
- Minimize applications of all fungicides during dry weather. **CAUTION: weather can be favorable for leaf spot even without rain.** Check leaf spot advisories to determine whether it is safe to delay fungicide applications.
- The programs listed are adaptable to an advisory program.
- The products listed are the ones most commonly used in our area. Not all labeled products are listed for sake of brevity and simplicity. Please check the [North Carolina Agricultural Chemicals Manual](#) for a complete listing of fungicides registered on peanuts in North Carolina

Using the North Carolina leaf spot advisory

Barbara Shew, Department of Entomology and Plant Pathology, NC State University

The North Carolina peanut leaf spot advisory is a cooperative effort by the State Climate Office of North Carolina and the Department of Plant Pathology at NC State University. The advisory is a safe way to minimize fungicide applications by spraying only when weather conditions favor disease.

In well-rotated fields, **the first fungicide spray should be applied at the very early pod stage (R3)**, which usually occurs in the first week of July. After the first spray, apply fungicides according to the leaf spot advisory.

Each day's advisory contains several lines of information for each location. **Each day's advisory: "spray today" or "do not spray today" can be found on the 7th line.** This is all you really need to know for your location. The other lines give additional information that you may find useful.

Advisory information:

Lines 1 & 2 – Date, name location of station. ECONET stations are indicated by an abbreviated name; airport stations are indicated by call letters. It is a good idea to check advisories the two stations nearest you.

line 3 – Set date. This is used to calculate the advisory.

line 4 – Lethal conditions. A temperature of 99°F or higher for 5 straight hours OR humidity less than 40% for 8 straight hours will kill the pathogen. If lethal conditions = true, favorable hours (below) are reset to 0.

line 5 - Favorable hours. An hour is favorable for leaf spot development when the humidity is at least 95% and temperature is between 61°F and 90°F during that hour. **A spray is advised when there have been at least 48 favorable hours since the set date**

line 6 – LESD (Last Effective Spray Date). A fungicide spray is assumed to protect for 14 days. **You do not need to spray if you have sprayed since the LESD even when the advisory says "spray today."**

line 7 – Today's advisory. If the advisory is "spray today" conditions are favorable for leaf spot and you should **spray if no fungicide has been applied in the past 14 days**. If the advisory is "do not spray today" a spray is not required.

lines 8 & 9. Growing degree days for peanuts (base 56) since the LESD and since May 1.

line 10 – Records count. The number of hourly weather observations out of the total possible observations. **The advisory may not be reliable if there are several missing records.**

line 11 – Most recent hourly observation. This should be 7:00:00 (7 a.m.) on the date of the advisory.



Using the North Carolina Sclerotinia advisory

Barbara Shew, Department of Entomology and Plant Pathology, NC State University

The North Carolina Sclerotinia advisory is a cooperative effort by the State Climate Office of North Carolina and the Department of Plant Pathology at NC State University. The advisory helps to identify periods that are favorable for Sclerotinia blight development so that protective sprays can be applied.

Sclerotinia advisories account for favorable weather only; they do not account for field history. **Fields with no history of disease do not need to be sprayed** unless a new outbreak is confirmed. In fields with a history of disease, careful scouting should begin in early July.

Sclerotinia blight risk increases when the canopy closes. There are two advisories for each location.

Use the advisory for **row index = 2** if rows are within 6" of touching.

Use the advisory for **row index = 3** if rows are touching.

Sprays normally are not needed if rows are more than 6" apart.

Advisory Details:

Date and station name - ECONET stations are indicated by an abbreviated name; airport stations are indicated by call letters. It is a good idea to check advisories for the two closest weather stations.

The advisory uses daily index values for the last 5 days. In addition to canopy development, moisture and temperature affect the risk of Sclerotinia blight.

- **High moisture favors disease. MI = 0 means that moisture is too low for disease. MI = 1 means that recent high moisture favors disease.** Conditions are favorable (MI = 1) if:
 - 1) RH was 95% or higher for at least 8 consecutive hours **or**
 - 2) at least ½ inch of rain fell in the past 5 days **or**
 - 3) at least 1 inch of rain fell in the last 10 days. The advisory lists all of the reasons that MI=1 on a given day. If your rainfall history is different, the advisory may not apply to you.
- **Cool average temperatures favor Sclerotinia blight.**
 - TI = 0 if the day's 24-hour **average** temperature was more than 82°F
 - TI = 1 if the average is between 77 to 82°F
 - TI = 2 if the average is between 72 to 77°F
 - TI = 3 if the average is 72°F or lower

Five day index – A spray is advised when the five day index is greater than 32.

Last effective spray date (LESD) – A spray is assumed to last 21 days. **You do not need to spray if you have sprayed since the LESD.**

Advisory –If the advisory is "**spray today**" conditions are favorable for Sclerotinia blight and you should spray if has been more than 21 days since the last Sclerotinia spray. If the advisory is "**do not spray today**" a spray is not required today.

Disease level - the five day index is used to rate the disease hazard as low (<32), moderate (32-47), high (48-98), or very high (≥99).

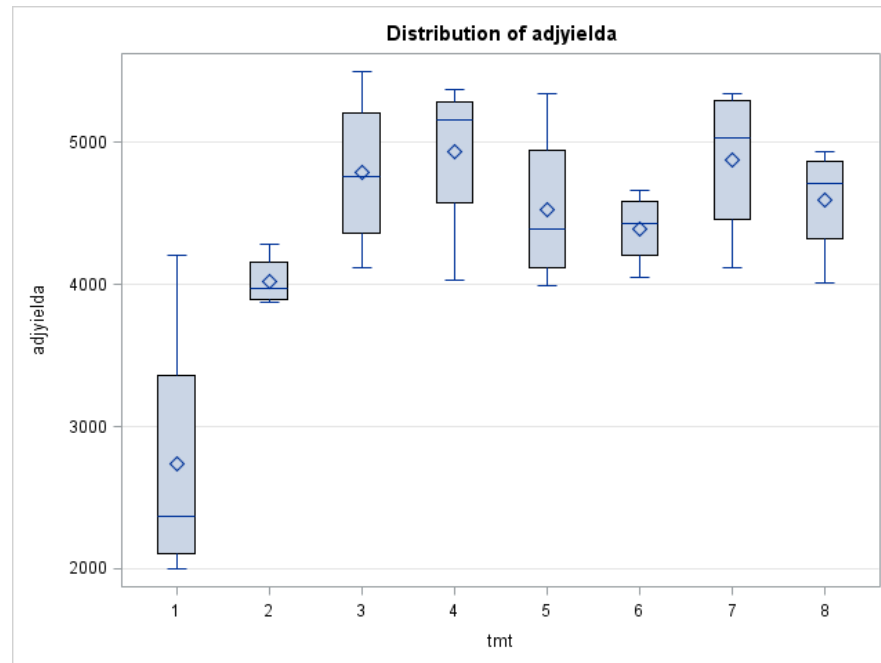
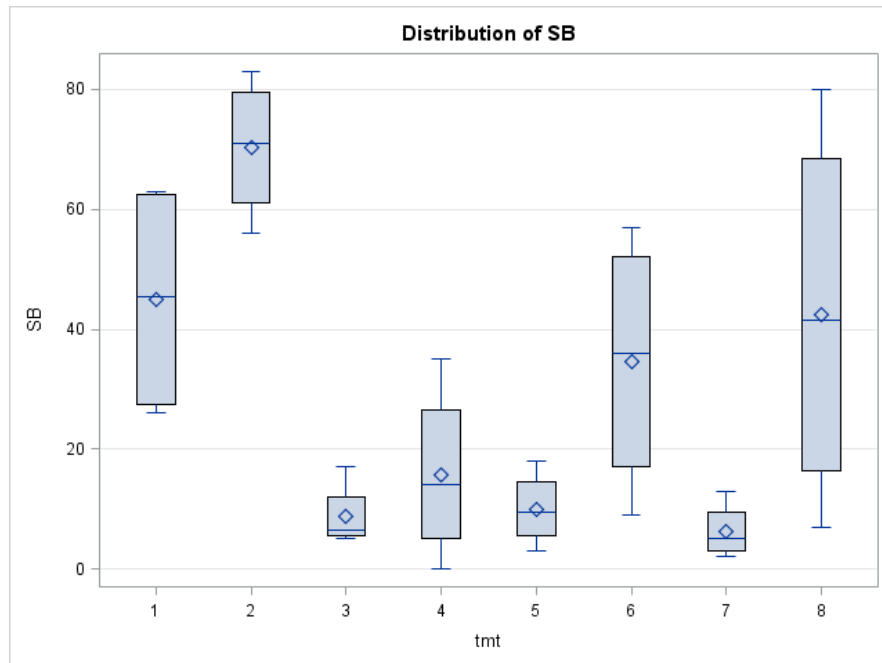
Growing degree days - for peanuts (base 56) since the LESD and since May 1.

Records count - number of hourly weather observations out of total possible observations. The advisory may not be reliable if there are several missing records.

Most recent hourly observation – should be or 7:00:00 (7 a.m.) on today's date.

Elatus, Alto, Miravis

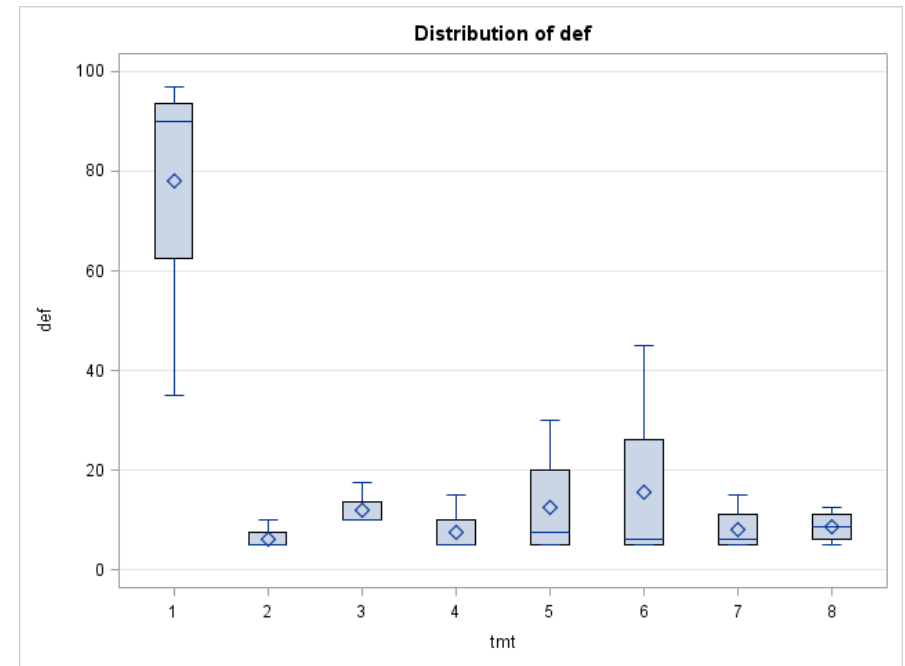
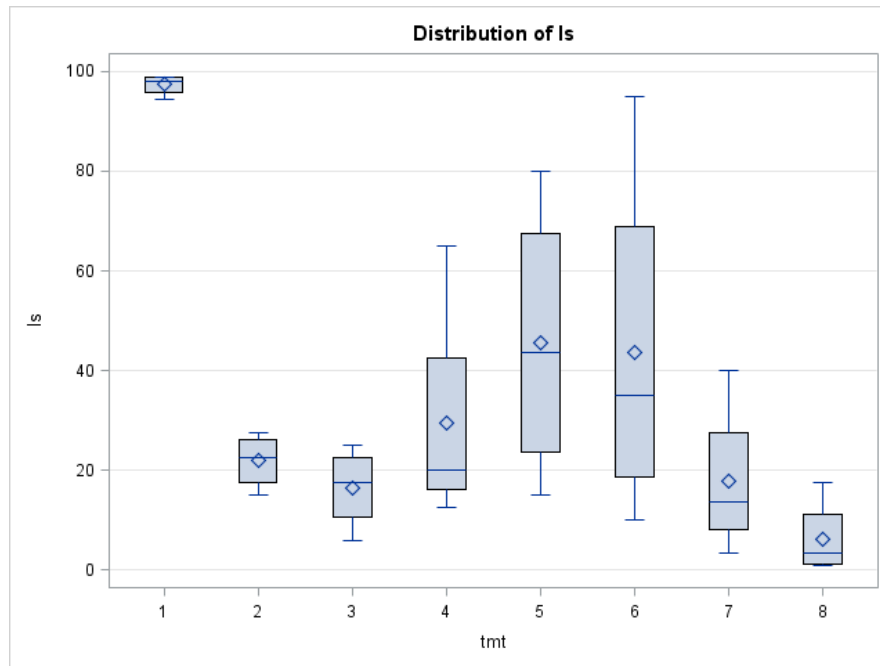
Extended intervals



	17-Jul	31-Jul	10-Aug (extended)	15-Aug	28-Aug	11-Sep
1	none	none	none	none	none	none
2	Alto + Bravo	Bravo	none	Alto + Bravo	Bravo	Bravo
3	Alto + Bravo	Bravo + Omega	none	Alto + Bravo	Bravo + Omega	Bravo
4	Alto + Bravo	none	Elatus + Miravis	none	Elatus + Miravis	Bravo
5	Alto + Bravo	none	Elatus + Miravis	none	Miravis	Bravo
6	Alto + Bravo	none	Miravis	none	Miravis	Bravo
7	Alto + Bravo	none	Omega + Miravis	none	Omega + Miravis	Bravo
8	Alto + Bravo + Miravis	Bravo	none	Alto + Bravo + Miravis	Bravo 1.5 pt	Bravo + Miravis

Elatus, Alto, Miravis

Extended intervals



	17-Jul	31-Jul	10-Aug (extended)	15-Aug	28-Aug	11-Sep
1	none	none	none	none	none	none
2	Alto + Bravo	Bravo	none	Alto + Bravo	Bravo	Bravo
3	Alto + Bravo	Bravo + Omega	none	Alto + Bravo	Bravo + Omega	Bravo
4	Alto + Bravo	none	Elatus + Miravis	none	Elatus + Miravis	Bravo
5	Alto + Bravo	none	Elatus + Miravis	none	Miravis	Bravo
6	Alto + Bravo	none	Miravis	none	Miravis	Bravo
7	Alto + Bravo	none	Omega + Miravis	none	Omega + Miravis	Bravo
8	Alto + Bravo + Miravis	Bravo	none	Alto + Bravo + Miravis	Bravo 1.5 pt	Bravo + Miravis